INTERSTATE COMMERCE COMMISSION REPORTS

VOLUME 345-II

DECISIONS OF THE
INTERSTATE COMMERCE COMMISSION
OF THE UNITED STATES

FEBRUARY 1976—DECEMBER 1976

REPORTED BY THE COMMISSION

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

INTERSTATE COMMERCE COMMISSION

GEORGE M. STAFFORD, *Chairman*
CHARLES L. CLAPP, *Vice Chairman*

RUPERT L. MURPHY
VIRGINIA MAE BROWN
DALE W. HARDIN
ROBERT C. GRESHAM
ALFRED T. MACFARLAND
A. DANIEL O'NEAL
ROBERT J. CORBER
BETTY JO CHRISTIAN

ROBERT L. OSWALD, *Secretary*

CONTENTS

Page

Members of the Commission ---------- II
Table of Cases Reported ---------- V
Table of Cases Cited ---------- VII
Opinions of the Commission ---------- 1
Index Digest ---------- 2090A

blank page

READEX
FICHE

TABLE OF CASES REPORTED

Volume II (Pages 867-2090)

*Denotes cases further considered

Page

- Coal, Investigation of Railroad Freight Rate Structure* 71,493
- Effects, Uneven, of General Increases on Individual Railroads—Investigation of Railroad Freight Rate Structure 2042
- Export—Import Rates and Charges, Investigation of Railroad Freight Rates Structure—Great Lakes 1364
  - Import Rates and Charges, Investigation of Railroad Freight Rate Structure—Pacific Coast 423
- Freight—Rate Structure, Railroad, Investigation of* 1,2042
  - Rate Structure, Railroad Investigation of—Coal* 71,493
  - Rate Structure, Railroad, Investigation of—Export-Import Rates and Charges—Great Lakes 1364
  - Rate Structure, Railroad, Investigation of—Export-Import Rates and Charges—Pacific Coast 423
  - Rate Structure, Railroad, Investigation of—Iorn Ores* 548
  - Rate Structure, Railroad, Investigation of—Scrap Iron and Steel* 867
  - Rate Structure, Railroad, Investigation of, Uneven Effects of General Increases on Individual Railroads 2042
  - Service, Railroad, Investigation of* 1223
- General Increases on Individual Railroads, Uneven Effects of—Investigation of Railroad Freight Rate Structure 2042
- Great Lakes, Investigation of Railroad Freight Rate Structure—Export-Import Rates and Charges 1364
- Import—Export Rates and Charges, Investigation of Railroad Freight Rate Structure—Great Lakes 1364
  - Export Rates and Charges, Investigation of Railroad Freight Rate Structure—Pacific Coast 423
- Increases, General in Individual Railroads, Uneven Effects of—Investigation of Railroad Freight Rate Structure 2042
- Individual Railroads, Uneven Effects of General Increases on—Investigation of Railroad Freight Rate Structure 2042
- Investigation—of Railroad Freight Rate Structure* 1,2042
  - Of Railroad Freight Rate Structure—Coal* 71,493
  - Of Railroad Freight Rate Structure—Export-Import Rates and Charges—Great Lakes 1364
  - Of Railroad Freight Rate Structure—Export Rates and Charges—Pacific Coast 423
  - Of Railroad Freight Rate Structure—Iron Ores* 548
  - Of Railroad Freight Rate Structure—Scrap Iron and Steel* 867
  - Of Railroad Freight Rate Structure—Uneven Effects of General Increases on Individual Railroads 2042
  - Of Railroad Freight Service* 1223

Page

- Investment, Net—Railroad Rate Base and Rate of Return* 55,410, 1492
- Iron—and Steel, Scrap, Investigation of Railroad Freight Rate Structure* 867
  - Ores, Investigation of Railroad Freight Rate Structure* 548
- Net Investment—Railroad Rate Base and Rate of Return* 55,410, 1492
- Ores, Iron, Investigation of Railroad Freight Rate Structures* 548
- Pacific Coast, Investigation of Railroad Freight Rate Structure—Export-Import Rate and Charges 423
- Railroad—Freight Rate Structure, Investigation of* 1,2042
  - Freight Rate Structure, Investigation of—Coal* 71,493
  - Freight Rate Structure, Investigation of—Export-Import Rates and Charges—Great Lakes 1364
  - Freight Rate Structure, Investigation of—Export-Import Rates and Charges—Pacific Coast 423
  - Freight Rate Structure, Investigation of—Iron Ores* 548
  - Freight Rate Structure, Investigation of—Scrap Iron and Steel* 867
  - Freight Rate Structure, Investigation of, Uneven Effects of General Increases on Individual Railroads 2042
  - Freight Service, Investigation of* 1223
  - Rate Base and Rate of Return, Net Investment* 55,410, 1492
- Scrap Iron and Steel, Investigation of Railroad Freight Rate Structure* 867
- Structure—Railroad Freight Rate, Investigation of* 1,2042
  - Railroad Freight Rate, Investigation of—Coal* 71,493
  - Railroad Freight Rate, Investigation of, Export-Import Rates and Charges—Great Lakes 1364
  - Railroad Freight Rate, Investigation of, Export-Import Rates and Charges—Pacific Coast 423
  - Railroad Freight Rate, Investigation of—Iron Ores* 548
  - Railroad Freight Rate, Investigation of—Scrap Iron and Steel* 867
  - Railroad Freight Rate, Investigation of—Uneven Effects of General Increases on Individual Railroads 2042

TABLE OF CASES CITED

Volume II (Pages 867-2090)

Page

Aberdeen & Rockfish R. Co. *v.* S.C.R.A.P., 422 U.S. 289 ---- 1157

Absorption—Lumber and Plywood—Pac. Coast Interior Orig., 316 I.C.C. 15 ---- 461,476

Accounting—for Federal Income Taxes, 318 I.C.C. 803 ---- 1511, 1571

  For Income Taxes—Interperiod Tax Allocation (Deferred Taxes), Decided 8/9/74, Served 8/28/74, 39 FR 33337 (34178 Sub-No. 2)- 1571

Ad Hoc Committee Consumer Protection *v.* United States, 317 F. Supp. 370 ---- 1261

Adequacies—Passenger Service—Southern Pac. Co., 335 I.C.C. 415 ---- 1234

Advances—in Rates—Eastern Case, 20 I.C.C. 243 ---- 1544

  In Rates—Western Case, 20 I.C.C. 307 ---- 1544

Allegheny-Ludlum Steel Corp. *v.* United States, 325 F. Supp. 352 ---- 1232

American Colloid Co. *v.* Akron C. & Y. R. Co., 321 I.C.C. 91 ---- 315, 1391,1438,1478

American Commercial Lines, Inc. *v.* Louisville & N. R. Co., 392 U.S. 571 ---- 1238

American Rail Box Car Co.—Pooling, 347 I.C.C. 862 ---- 1274, 1807

American Round Bale Press Co. *v.* Atchison, T. & S. F. Ry. Co., 32 I.C.C. 458 ---- 111

American Sugar Refining Co. *v.* Ahnapee & W. Ry. Co., 322 I.C.C. 717 478

American Trucking Assns., Inc., *v.* Atchison, T. & S. F. Ry. Co., 387 U.S. 397 ---- 1235

Ann Arbor R. Co. *v.* United States, 281 U.S. 658 ---- 1551

Annual—Reports of Class I Railroad Companies, 341 I.C.C. 205 ---- 59,1573

  Reports of Motor Carriers of Property, 346 I.C.C. 508 ---- 1574

Assigned Cars for Bituminous Coal Mines, 346 I.C.C. 327; 350 I.C.C. 455 ---- 515,527

Atchison, T. & S. F. Ry. Co. *v.* United States, 218 F. Supp. 359 ---- 1378

Badger Lumber & Coal Co. *v.* Atchison, T. & S. F. Ry. Co., 156 I.C.C. 427 ---- 1231,1328

Baltimore & O. R. Co. *v.* Boston & M. R. Co., 373 U.S. 372 ---- 1397

Big River Industries, Inc., *v.* Aberdeen & R. R. Co., 329 I.C.C. 539 ---- 1417

Bills of Lading, 52 I.C.C. 671 ---- 1288

Bituminous—Coal from Tenn., Ky. and Va. to N.C., Tenn. and Va., 325 I.C.C. 548 ---- 108

  Coal Within Eastern District, 346 I.C.C. 590 ---- 117,512

Bluefield Water Works & Improvement Co. *v.* Public Service Comm. of the State of West Virginia, 262 U.S. 679 ---- 1620,1687

Boston & M. R. Co. *v.* United States, 202 F. Supp. 830 ---- 1397

345 I.C.C.

Page

Brook-Rauch Mill & Elevator Co. *v.* St. Louis, I. M. & S. Ry. Co., 21 I.C.C. 651 1241
Cancellation of Wharfage Absorption, 335 I.C.C. 477 480
Canned—Goods from Pacific Coast to Eastern Points, 315 I.C.C. 769 478
  Or Preserved Foodstuffs—Pacific Coast to Gulf, 314 I.C.C. 569 470
Car—Demurrage Rules, Nationwide, 350 I.C.C. 777 1283
  Peddling Case, 45 I.C.C. 494 1283
  Shortage—Insufficient Transp. Facilities, 12 I.C.C. 561 1271,1291
  Supply Investigation, 42 I.C.C. 657 1236
Carstens Packing Co. *v.* Oregon Short Line R. Co., 17 I.C.C. 324 111
Chesapeake & O. Ry. Co. *v.* Commissioner of Internal Revenue, 64 T.C. 352 1535
Chicago & E. I. R. Co. *v.* United States, 384 F. Supp. 298; 421 U.S. 956 506,1378
Chicago Board of Trade *v.* Illinois Central R. Co., 325 I.C.C. 412; 329 I.C.C. 529; 344 I.C.C. 818 505,506,821,1181, 1378,1388,1428,1486
Chicago, R. I. & P. Ry. Co. *v.* Hardwick Farmers Elevator Co., 226 U.S. 426 1291
City of Spokane, Wash., *v.* Northern Pac. Ry. Co., 15 I.C.C. 376 479
Class—Rate Investigation, 1939, 262 I.C.C. 447; 264 I.C.C. 41; 268 I.C.C. 577; 281 I.C.C. 213; 286 I.C.C. 5 16,471,1368
  Rates, Mountain-Pacific Territory, 296 I.C.C. 555 472
Coal—from Fulton County, Ill. to Minnesota, 315 I.C.C. 627 541
  From Ky., Va., and W. Va., to Virginia, 308 I.C.C. 99 336
  From Southern Mines to Tampa and Sutton, Fla., 318 I.C.C. 371 505
  From West Virginia to Monroe, Michigan, Mimeo 5/21/75 (NPR) (I&S No. 8974) 544
  Ky., Tenn. and Va. to North Carolina, 329 I.C.C. 572 110
  To New York Harbor Area, 311 I.C.C. 355 521
Columbia Metals Corp. *v.* Alton & S. R., 278 I.C.C. 761 1381
Commodity Rates to Pacific Coast Terminals, 32 I.C.C. 611 479
Consignee's Obligation to Unload Rail Cars, 340 I.C.C. 405 1277
Consolidated—Classification Case, 54 I.C.C. 1 1402
  Freight Classification, 281 I.C.C. 329 471
Contract Rates, Rugs and Carpeting from Amsterdam, N.Y., 313 I.C.C. 247 1289
Cooperative Grange League Fed. Exc. *v.* Akron, C. & Y. R. Co., 323 I.C.C. 174 1491
Corn and Soybeans, Midwest to Pacific Northwest, 339 I.C.C. 465 1488
Cudahy Packing Co.—*v.* Akron, C. & Y. R. Co., 318 I.C.C. 229 1378
  v. Atchison, T. & S. F. Ry. Co., 234 I.C.C. 569 1413
D.C. Transit System, Inc., *v.* Democratic Central Committee of D.C., 415 U.S. 935 1617,1627
Dayton-Goose Creek Ry. Co. *v.* United States, 263 U.S. 456 1546
Delaware, Lackawanna & W. Coal Co. *v.* Centeal R. of N.J., 185 I.C.C. 168 1411
Democratic Central Committee of D.C. *v.* Washington Metropolitan Area Transit Comm., 485 F. 2d 786 1617,1627

Page

Demurrage—Charges of Property by Rail, 349 I.C.C. 411 ---------- 1285
Rules and Charges, Nationwide, 340 I.C.C. 83 ---------- 1283
Distribution of Privately Owned Freight Cars, 346 I.C.C. 278 ---------- 527
Dixie Carriers, Inc., *v.* United States, 351 U.S. 56 ---------- 1238
Duluth Board of Trade *v.* Chicago & N. W. Ry. Co., 314 I.C.C. 695 ---- 1387
Duralite Co., Inc., *v.* Erie Lackawanna Ry. Co., 339 I.C.C. 312 ---------- 1240
Eastern—Class-Rate Investigation, 164 I.C.C. 314 ---------- 1402
Livestock Cases of 1926, 165 I.C.C. 277 ---------- 1381
Emergency Freight Charges, 1935, 208 I.C.C. 4 ---------- 1550
Emery Common Carrier Rates—Various Commodities, 326 I.C.C. 415 --- 1400
Equalization of Rates at North Atlantic Ports, 311 I.C.C. 689 ---------- 1393
Erie Lackawanna Ry. Co. *v.* Penn Central Co., 338 I.C.C. 513 ---------- 1270
Excess Income of Richmond, F. & P. R. Co., 170 I.C.C. 451 ---------- 1539
Expeditious Handling of Division of Revenue Cases, 353 I.C.C. 349 ----- 2051
Export—and Import Rates, Ex Parte No. 281, Order 10/20/72 (I&S No. 8796) ---------- 482
And Import Rates to and from Southern Ports, 205 I.C.C. 511 ------- 1393, 1416,1473
Freight Free Time, 47 I.C.C. 162 ---------- 1283
Federal Power Comm. *v.* Hope Natural Gas Co., 320 U.S. 591 -------- 1620,1687
Fifteen—Per Cent Case, 1931, 178 I.C.C. 539 ---------- 1549
Percent Case, 1937-1938, 226 I.C.C. 41 ---------- 1550
Five Per Cent Case, 31 I.C.C. 351 ---------- 1545
Florida East Coast Ry. Co. *v.* United States, 327 F. Supp. 1076 ---------- 1232
Fulton Bag and Cotton Mills *v.* New York C. R. Co., 139 I.C.C. 225 --- 441
Gateway Elimination, 119 M.C.C. 170 ---------- 1346,1633
General Motors Corp. *v.* New York Central R. Co., 311 I.C.C. 622 ------ 440
General Rate Level Investigation, 1933, 195 I.C.C. 5 ---------- 1550
Grain—and Grain Products, 205 I.C.C. 301 ---------- 436
And Grain Products Within the Western District, Order 6/8/65 (Fourth Section Order No. 17200); 284 I.C.C. 723 ---------- 438,447
By Rent-A-Train, IFA Territory to Gulf Ports, 335 I.C.C. 111; 339 I.C.C. 579 ---------- 1289,1704
Greyhound Corp.—Securities, 336 I.C.C. 575 ---------- 1571
Stock, 90 M.C.C. 215 ---------- 1569
Guaranteed Rates, Sault Ste. Marie, Ontario, to Chicago, 315 I.C.C. 311 ---------- 1289
Gums and Resins from East and South to Pacific Coast, 301 I.C.C. 255 ---------- 478
Hanna Mining Co. *v.* Missouri Pac. R. Co., 332 I.C.C. 166 ---------- 1289
Hillsborough County Port Authority *v.* Ahnapee & W. Ry., 313 I.C.C. 691 ---------- 1474
Houston & Texas Central R. Co. *v.* Mayes, 201 U.S. 321 ---------- 1291
Illinois Intrastate Coal Rates to East St. Louis, Ill., 304 I.C.C. 769 ------ 117,513
Incentive—Per Diem Charges—1968, 337 I.C.C. 183; 349 I.C.C. 303 1271,1273, 1284
Per Diem Charges—1968 (XF Cars), 350 I.C.C. 11 ---------- 1278
345 I.C.C.

Page

Increased—Demurrage Charges, 1956, 300 I.C.C. 577 ---- 1283
Freight Rates, 1947, 270 I.C.C. 403 ---- 479,1552
Freight Rates, 1948, 272 I.C.C. 695; 276 I.C.C. 9 ---- 1552
Freight Rates, 1951, 284 I.C.C. 589; 297 I.C.C. 17 ---- 1518,1553
Freight Rates, 1958, 302 I.C.C. 665; 304 I.C.C. 289 ---- 477,1556
Freight Rates, 1960, 311 I.C.C. 373 ---- 477,1556
Freight Rates, 1967, 329 I.C.C. 854; 332 I.C.C. 280 ---- 11,29,680 1158,1226,1556,1567
Freight Rates, 1968, 332 I.C.C. 590; 332 I.C.C. 714 ---- 57,1158, 1495,1511,1538,1556,1567,1612,1657
Freight Rates, 1969, 337 I.C.C. 436 ---- 1158
Freight Rates 1970 and 1971, 339 I.C.C. 125 ---- 57,356, 425,448,481,839,975,1158,1195,1224,1495,1556,1567,1620
Freight Rates and Charges, 1972, 341 I.C.C. 290 ---- 482,976 1159,1559
Freight Rates and Charges, 1973, 344 I.C.C. 589; 349 I.C.C. 250 ---- 66,1159 1559,1623
Freight Rates and Charges, 1974, 349 I.C.C. 862 ---- 1160,1559
Freight Rates and Charges, 1975, 349 I.C.C. 555 ---- 1161,1559,1571
Freight Rates and Charges, 1975, Nationwide, 351 I.C.C. 220 ---- 1559,1571
Freight Rates, E. and W. Territories, 1956, 299 I.C.C. 429; 299 I.C.C. 557 ---- 1554
Freight Rates, E., W., and S. Territories, 1956, 300 I.C.C. 633 ---- 1554,1568
Railway Rates, Fares, and Charges, 1942, 248 I.C.C. 545; 255 I.C.C. 357; 256 I.C.C. 502; 258 I.C.C. 455; 259 I.C.C. 159 ---- 1551
Railway Rates, Fares, and Charges, 1946, 264 I.C.C. 695; 266 I.C.C. 537 ---- 1551,1552,1566
Rates, 1920, 58 I.C.C. 220 ---- 1547
Rates on Iron Ore, 313 I.C.C. 549 ---- 832
Increases in Freight Rates and Charges—1973, 346 I.C.C. 400 ---- 1303
Ingot Molds from Pennsylvania to Steelton, Ky., 323 I.C.C. 758 ---- 1615
Institute of Scrap Iron & Steel, Inc., *v.* Akron, C. & Y. R., 316 I.C.C. 55 ---- 976,1158
Interstate Comm. Comm. *v.* New York, N. H. & H. R. Co., 372 U.S. 744 ---- 1238
Investigation—of Adequacy of Freight Car Ownership, 323 I.C.C. 48; 335 I.C.C. 264; 335 I.C.C. 874; 341 I.C.C. 64; 346 I.C.C. 497 ---- 1232, 1263,1271,1284,1328
Of Railroad Freight Rate Structure, 340 I.C.C. 868; 345 I.C.C. 1; 345 I.C.C. 423 ---- 1,27,61,75,551,834,1367,1768,2042
Of Railroad Frt. Rate Structure—Coal, 345 I.C.C. 71 ---- 493,823, 1184,1244
Of Railroad Freight Service, 341 I.C.C. 1; 345 I.C.C. 1223 ---- 1224,2043
Iron—or Steel Cans from New Orleans, La., to Georgia, 310 I.C.C. 543 ---- 1394
Ore from Eastern Ports to C.F.A. Points, 321 I.C.C. 473 ---- 685
Ore from Norfolk, Va., to Toledo Dock, Ohio, 291 I.C.C. 93 ---- 1386
Ore Rate Cases, 41 I.C.C. 181; 44 I.C.C. 368; 48 I.C.C. 650 ---- 680,819
Kansas City Board of Trade *v.* United States, 314 U.S. 534 ---- 505

Page

Kansas Intrastate Freight Rates and Charges—1971, 343 I.C.C. 400 ------ 839,1195
Lake Cargo Coal from Ill., Ind., and Ky., to Chicago, 243 I.C.C. 404 --- 1381
Lake Carriers' Assn. *v.* New York Central R. Co., 343 I.C.C. 491 ------- 545
Loss and Damage Claims, 346 I.C.C. 33 ------- 1250,1277
Lumber from the South and Southwest, 198 I.C.C. 753 ------- 1308
Magnesite from Pacific Coast to the East, 286 I.C.C. 331 ------- 1381
Maintenance of Records Pertaining to Demurrage, 352 I.C.C. 739 ------- 1285
Maple Island Farm, Inc., *v.* Chicago, B. & Q. R. Co., 280 I.C.C. 353 --- 1400
Meat and PHP, TOFC, SWL, WTL, Official Territories, 340 I.C.C. 214; 344 I.C.C. 299 ------- 1379,1413
Merchants' Union of Spokane Falls *v.* Northern Pac. R. Co., 5 I.C.C. 478 ------- 479
Middle Atlantic Conference *v.* United States, 353 F. Supp. 1109 ------- 1292
Molasses from New Orleans, La., to Peoria and Pekin, Ill., 235 I.C.C. 485 ------- 112
National Elec. Mfrs. Assn. *v.* Aberdeen & R. R. Co., 349 I.C.C. 502 ---- 315
Net Investment—Railroad Rate Base and Rate of Return, 340 I.C.C. 829; 345 I.C.C. 55; 345 I.C.C. 410 ------- 55,410,1495,1523,1612,1623
New Jersey Steam Navigation Co. *v.* Merchants' Bank, 47 U.S. 344 ------- 1240
New Procedures in Motor Carrier Rev. Pro., 351 I.C.C. 1 ------- 1574
New York *v.* United States, 331 U.S. 284 ------- 1387,1429
New York Central R. Co. *v.* United States, 207 F. Supp. 483 ------- 1413
North Carolina *v.* United States, 325 U.S. 507 ------- 1555
North Western Employees—Pur.—Chicago & N. W. Ry. Co., 342 I.C.C. 58 ------- 1571
Patterson *v.* Louisville & N. R., 269 U.S. 1 ------- 441
Pennsylvania Paraffine Works *v.* Pennsylvania R. Co., 34 I.C.C. 179 ------ 1235
Pennsylvania R. Co.—Merger—New York Central R. Co., 327 I.C.C. 475 ------- 1624
Peoria & P. U. Ry. Co. *v.* United States, 263 U.S. 528 ------- 1232,1328
Permain Basin Area Rate Cases, 390 U.S. 747 ------- 1620
Phelps Dodge Corp. *v.* Director General, 57 I.C.C. 714 ------- 1381
Port Arthur Cham. Comm. & Shipping *v.* Aberdeen & R. R. Co., 169 I.C.C. 753 ------- 1397
Practices of Motor Common Carrier of Household Goods, 111 M.C.C. 427 ------- 1264
Procedures Governing Rail General Increase Proc., 351 I.C.C. 544 ------- 522,1574, 1595,2046
Proposed Advances in Freight Rates, 9 I.C.C. 382 ------- 1543
Propriety of Operating Practices—Terminal Services, 209 I.C.C. 11 ------- 1269
Providence Coal Co. *v.* Providence & W. R. Co. 1 I.C.C. 107 ------- 111
Rates on Grain, Grain Prodcuts, and Hay, 64 I.C.C. 85 ------- 1548
Reduced—Commodity Rates to Pacific Coast, 89 I.C.C. 512 ------- 479
    Rates, 1922, 68 I.C.C. 676 ------- 1547
    Rates from New York Piers, 81 I.C.C. 312 ------- 479
    Transcontinental Lumber Rates, 1961, 318 I.C.C. 815 ------- 479
Released Rate Rules—National M. Freight Classification, 306 I.C.C. 495 ------- 1293
Rich Ladder & Mfg. Co. *v.* Akron, C. & Y. Ry. Co., 241 I.C.C. 475 ---- 1417
345 I.C.C.

Page

Rules to Govern Assembling and Presenting Cost Evidence, 337 I.C.C. 298 ---------- 15,27
St. Louis & O'Fallon Ry. Co. *v.* United States, 279 U.S. 461 ---------- 1517
Schaffer Transp. Co. *v.* United States, 355 U.S. 83 ---------- 1238
Scientists Institute for Public Information, Inc., *v.* Atomic Energy Comm., 481 F. 2d 1079 ---------- 13,370
Seaboard Air Line R. Co. *v.* Southern Ry. Co., 329 I.C.C. 17 ---------- 505
Sea-Land Service, Inc., *v.* Baltimore & O. R. Co., 326 I.C.C. 708 ---------- 773
Smyth *v.* Ames, 169 U.S. 466 ---------- 1515
Soap from Jersey City to Norfolk, 253 I.C.C. 231 ---------- 1381
Southern States Cooperative, Inc., *v.* Baltimore & O. R. Co., 323 I.C.C. 400 ---------- 1386
State Corp. Comm. of N. Mex. *v.* Southwestern Motor Frt., 329 I.C.C. 803 ---------- 1181
Sterling Colo. Beef Co. *v.* Atchison, T. & S. F. Ry. Co., 339 I.C.C. 530 ---------- 1378,1399
Substituted Service—Piggyback, 322 I.C.C. 301 ---------- 1239,1289
Sugar Cases of 1951, 284 I.C.C. 333 ---------- 478
Switching and Minimum Carload Charges, Houston, Tex., 351 I.C.C. 146 ---------- 772
Tank Car Allowances, Southern Ry. System, 329 I.C.C. 466 ---------- 1722
Texas & Pac. Ry. Co. *v.* Interstate Comm. Comm., 162 U.S. 197 ---------- 1386,1402
Transcontinental—Cases of 1922, 74 I.C.C. 48 ---------- 479
  Commodity Rates, 48 I.C.C. 79 ---------- 479
  Rail Rates, 268 I.C.C. 567 ---------- 479
  Rates, 46 I.C.C. 236 ---------- 479
Trimount Bituminous Products Co. *v.* Bangor & A. R. Co., 304 I.C.C. 513 ---------- 1400
Uniform System of Accounts for Railrod Companies, 309 I.C.C. 289 ---------- 57
United States—*v.* Allegheny-Ludlum Steel Corp., 406 U.S. 742 ---------- 1232,1328
  v. Great Northern Ry. Co., 301 I.C.C. 21 ---------- 479
  v. Pennsylvania R. Co., 242 U.S. 208 ---------- 1231,1328
Volker & Co. of Texas *v.* Atchison, T. & S. F. Ry., 318 I.C.C. 249 - 1379,1414
Wells & Sons *v.* Chicago B. & Q. R. Co., 161 I.C.C. 145 ---------- 1234
Wheat, Minnesota, Montana, North Dakota, and South Dakota to Minnesota and Wisconsin, Mimeo 10/16/74 (NPR) (No. 35527) ---------- 485
William Volker & Co. of Texas *v.* Atchison, T. & S. F. Ry., 318 I.C.C. 249 ---------- 1379,1414

INTERSTATE COMMERCE COMMISSION REPORTS

EX PARTE NO. 270 (SUB-NO. 6)

TABLE OF CONTENTS

Page

General Introduction:

Highlights of the Report 873
Part I—Railroad Freight Rate Structure on Scrap Iron and Steel 874
Part I(A)—Production of scrap iron and steel 874
Part I(A)(1)—Sources of scrap iron and steel 874
Part I(A)(2)—Obsolete scrap production 883
Part I(A)(3)—Scrap marketing 894
Part I(A)(4)—Environmental considerations in production 895
Part I(B)—Consumption of scrap iron and steel 897
Part I(B)(1)—Figures and trends 897
Part I(B)(2)—Locations of demand 904
Part I(B)(3)—Iron and steelmaking operations 916
Part I(B)(4)—Environmental considerations in manufacture 946
Part I(C)—Transportation of scrap iron and steel (physical) 967
Part I(C)(1)—Transportation characteristics 967
Part I(C)(2)—Routes of movement 978
Part I(D)—Transportation of scrap iron and steel (financial) 984
Part I(D)(1)—Relationship of rate to demand for scrap iron and steel 984
Part I(D)(2)—Rate structure by territories 991
Part I(D)(3)—Revenue yields and cost of service of representative or repetitive movements 1015
Part I(D)(4)—Analysis of other cost evidence 1049
Part I(D)(5)—Revenue mileage scatter charts 1103
Part I(D)(6)—The Commission's rail revenue contribution study by commodity and territory for the years 1966, 1969, and 1972 1116
Part I(D)(7)—Financial data of involved railroads 1128
Part II—Intercommodity Rate and Revenue-Cost Relationships Between Scap Iron and Steel and Iron Ores 1157
Part II(A)—Relationship of scrap iron and steel and iron ores in the steelmaking process 1157
Part II(B)—Revenue/cost relationships 1167
Part III—Self-defeating Nature of General Increases on Scrap Iron and Steel 1178
Part IV—Disparities and Distortions Caused by General Increases 1180
Part V—Uneven Effects of Increases on Individual Railroads 1186
Part VI—Railroad Service 1189
Part VII—Matters Not Otherwise Listed 1193
Part VIII—Final Environmental Impact Statement 1196
Part IX—Ultimate Findings and Recommendations 1199
Index of Figures, Tables, and Maps 1201
Bibliography of Sources 1219

EX PARTE NO. 270 (SUB-NO. 6)

INVESTIGATION OF RAILROAD FREIGHT RATE STRUCTURE—SCRAP IRON AND STEEL

Decided February 4, 1976

1. Upon investigation of the railroad freight rate structures on scrap iron and steel, and in particular the effect of general freight rate increases thereon, examined the technical, economic, and environmental aspects of scrap production, marketing, and consumption; compared the transportation characteristics and rate structures of scrap and iron ores; made extensive intracommodity and intercommodity revenue-cost comparisons; and composed other material measuring the reasonableness of the freight rate structure on scrap iron and steel.
2. Upon consideration of the record, found that because the demand for scrap is inelastic to changes in the transportation rate charged, fluctuations in the freight rate for scrap iron and steel will have very little impact on scrap consumption in the near term; that maintaining or lowering current rates will result in a loss of revenues by the railroads with only minimal improvements in environmental quality; that in the long term, demand for obsolete scrap will exceed available supply due to anticipated changes in steel production processes by 1985; that changes in transportation rates will have negligible impact on the environment; that the delivered price of the higher value commodity, scrap iron and steel, is significantly less dependent on rail freight rates than is the delivered price of iron ores; that the predominant movement of iron ores in trainload quantities makes a higher revenue contribution to the railroads than does the predominant single-car movement of scrap iron and steel, and that the freight rate structure of these commodities does not discriminate against the movement of scrap; that the relationship between scrap iron and steel and iron ores in the steelmaking process is, in almost all cases, complementary and not competitive; that the few instances of competition between scrap and iron ore and the limited effect that rail freight rates would have on this competition or on the environment would not justify linking iron ore and scrap in a fixed freight rate relationship; that the transportation characteristics of scrap iron and steel do not compare favorably with the transportation characteristics of iron ores and that on a per-ton basis, services provided on scrap movements are considerably more costly to the railroads than are the services provided on movements of iron ores; that the overall freight rate structure on scrap iron and steel is compensatory and not unreasonably high, but some individual rates are below the zone of reasonableness and others may be above the zone; that the railroads should examine current costs and revenues on movements of scrap iron and steel in light of our findings as to the revenue/cost relationships existing on September 1, 1973, and may wish to consider whether there is a need for adjustments; that the

respondents should examine current costs and revenues on movements shown to have a rate-variable cost relationship in excess of 230 percent at the September 1, 1973, rate and cost levels and that in future complaint cases a showing that movements of scrap iron and steel return revenues in excess of 230 percent of variable cost may raise a rebuttable presumption as to the justness and reasonableness of the rates; that in future general rate increase proceedings on scrap iron and steel, if any holddowns are applied, they should be based on environmental or other data affirmatively demonstrating that the failure to apply such holddowns would have a significant negative impact on the environment or on the movement of scrap; that the complementary relationship between iron ores and scrap iron and steel, does not, standing alone, warrant the application of holddowns, in all instances; that, when it appears that terminal and line-haul expenses are shown to increase by similar percentages, to prevent increasing the relative burden borne by short-mileage movements, further analysis and consideration should be given to the application of flat percentage increases; that the impact of general freight rate increases applied to the transportation of scrap iron and steel has not been self-defeating and has been necessary in generating additional revenue to pay for increased labor costs and higher prices of materials and supplies; that the application of general increases authorized by the Commission has not caused any substantial distortions in the freight rate structure, but that some distortions in the freight rate structure exist which have evolved apart from general freight increases and which in some instances have been amplified by such general increases; that the impact of general freight increases on scrap iron and steel has not been shown on this record to have had an uneven effect in meeting the revenue requirements of individual railroads; that the general freight increases sought by the railroads and authorized by the Commission have for the most part been for the purpose of offsetting higher prices of materials and supplies and increased wage costs; and that while railroad service on scrap iron and steel movements is currently adequate in most cases, close scrutiny regarding the financial contribution made by movements of scrap will be necessary to prevent any possible adverse effect on the capacity of the railroads to provide adequate service.

3. Appropriate recommendations consistent with the findings made.
4. Order entered closing the Sub-No. 6 proceeding.

William F. Cottrell, Nicholas J. Harlovic, Howard D. Koontz, Charles N. Marshall, Gerald J. Robinson, James L. Tapley, and *John S. Walker* for respondent railroads.

Leonard S. Goodman, Joseph C. Lynch, and *William R. Southard* for Special Projects Staff, Bureau of Enforcement (formerly Special Projects Counsel to the Commission).

A. Blakeman Early, and *H. Lanier Hickman, Jr.,* for the United States Environmental Protection Agency.

John H. Caldwell, John F. Donelan, John K. Maser III, Paul V. Miller, Warren Price, Jr., David Reichert, Russell R. Sage, and *Stephen D. Strauss* for shippers and other interested parties.

REPORT AND ORDER OF THE COORDINATOR

HARDIN, *Commissioner:*

This subnumbered proceeding, as noted in the prior report of the Coordinator in *Investigation of Railroad Freight Rate Structure*, 345 I.C.C. 1 (1973), was instituted for the purpose of examining in detail the rate structure on scrap iron and steel. As stated in the prior report, the principal foci of this subnumbered proceeding are as follows: (1) the possible self-defeating nature of general rate increases on scrap iron and steel with respect to generating revenues, (2) any disparities and distortions in rate relationships caused by general rate increases on scrap iron and steel, (3) the uneven effects of general freight rate increases on scrap iron and steel on individual railroads, and (4) the effect of such general increases on scrap iron and steel on railroad incentive to improve service in line with shipper requirements.

As further stated on page 3 of the prior report:

> The ultimate objective of this proceeding is to take whatever corrective action may be shown to be necessary. Such corrective action may take many forms; examples would include requiring particular rates to be increased or decreased, taking into consideration findings arrived at in this investigation when considering individual rate proposals sponsored singly or jointly by the railroads at the suspension or investigation level, considering the findings in this proceeding as supplementing the record in future rail general increase cases, or recommending statutory changes.

The evidence in this proceeding was developed under a nonadversary procedure. A format for the presentation of evidence was established by order of the Coordinator on December 27, 1973, and all persons were given a full opportunity initially to submit evidence they deemed appropriate, including evidence of cost of service. Opportunity was likewise given all parties to present evidence in rebuttal and surrebuttal. In order to promote a nonadversary atmosphere throughout this proceeding, the parties were urged to consult with the Special Projects Counsel, an independent counsel appointed by the Commission to assist in the development of a record in the public interest.

The December 27, 1973, order instituting this investigation directed the parties to submit evidence divided into seven parts. These parts relate to the previously stated issues.

Under Part I, Railroad Freight Rate Structure on Scrap Iron and Steel, the parties were given the following instructions: maps, diagrams, representative and/or repetitive rates, and narratives depicting the freight rate structures and formulas upon which the freight rates on scrap iron and steel are based, as of September 1, 1973, should be shown. Complete tariff references must be given for all rates shown. Evidence designed to show the traffic movements and the respondents' participation should be submitted. Representative and/or repetitive carload movements should show origin, destination, rate, minimum weight, actual loading, carload revenue, actual and short-line distances, ton-mile earnings based on actual distances and estimate of extent rates are used. Multiple-car and trainload movements should show origin, destination, actual and short-line distances, rate, required minimum weight, actual loading, carload revenue, rate reduction over single carload rate, ton-mile earnings based on actual distances, and an estimate of the extent to which such multicar-type movements are made (tons moved).

Under Part II, Intercommodity Rate and Revenue/Cost Relationships Between Scrap Iron and Steel and Iron Ores, the parties were given the following instructions. Because of the intercommodity relationship between scrap iron and steel and iron ores, as previously noted in the order served December 28, 1973, in this proceeding, evidence of cost of service and revenue/cost relationships for the transportation of representative and/or repetitive movements described in part I above and in part I of the procedural order in Ex Parte No. 270 (Sub-No. 5), Investigation of Railroad Freight Rate Structure—Iron Ores, served this date, should be introduced into evidence, if readily available, whether prepared under Rail Form A costing procedures or other costing procedures. Although, as stated in the Coordinator's report, 345 I.C.C. 1, 18, "primary reliance will continue to be placed on the Rail Form A cost formula," parties are not precluded from presenting cost evidence based on other costing procedures. Parties are reminded that in this broad investigation it will be impossible to consider the cost with respect to individual nonrepresentative and/or nonrepetitive movements, and, accordingly, parties should indicate the tonnage involved when submitting cost evidence with respect to particular movements.

Under Part III, Self-Defeating Nature of General Increases on Scrap Iron and Steel, the parties were given the following instructions:

A. Respondents should show the general rate increases sought, those authorized by the Commission, and those actually applied by the carriers individually or any other rate change on all significant movements of scrap iron and steel beginning with and subsequent to

Ex Parte No. 256 increases. Reasons for the application of increases less than those authorized as well as other rate changes should be set forth.

B. Evidence by any party designed to show that general rate increases on scrap iron and steel may or may not have been self-defeating in nature with respect to generating revenues.

Under Part IV, Disparities and Distortions Caused by General Increases, the parties were instructed to include in their submissions the following: Evidence relating to rate changes affected by general rate increases, for the movement of scrap iron and steel beginning with and subsequent to Ex Parte No. 256 increases which may have resulted in disparitics or distortions between competing shippers and/or localities. This evidence should be accompanied by formulas upon which the freight rates on scrap iron and steel are based and must be accompanied by complete tariff references for all rates shown. This evidence should specify any reason, if known, for such disparities and distortions.

Under Part V, Uneven Effects of Increases on Individual Railroads, the parties were asked to present evidence designed to show the uneven revenue effects (if any) of general rate increases in freight rates on scrap iron and steel for individual railroads, why these results may have occurred, and what corrective action could be taken to remedy these effects.

Under Part VI, Railroad Service, the parties were asked to present evidence bearing on the issue of whether general increases have provided sufficient revenues to induce the railroads to undertake improvements in service to meet shippers' requirements, and evidence as to whether the railroads, in their proposed rates in general rate increase proceedings, have taken into account possible variations in services being provided shippers.

Under Part VII, Matters Not Otherwise Listed, the instructions given were that all parties should endeavor to submit their evidence into one or more of the categories listed in parts I through VI above, including revenue/cost relationships. Evidence submitted under part VII should specifically indicate the purpose for which it is being introduced and the reason it does not come within one of the six foregoing categories. The principal focus of the investigation as set forth in the report of the Coordinator, 345 I.C.C. 1, should be kept in mind as well as the relationship of scrap iron and steel with iron ores.

Highlights of the Report

The following are the main highlights of the report:

-0- Furnishes the Commission, public interest groups, shippers, and carriers with detailed information concerning the freight rate structures on scrap iron and steel for future use.
-0- Describes the technical, financial, and environmental aspects of the production and consumption of scrap.
-0- Compares the transportation characteristics of scrap and iron ores.
-0- Explores the relationship of the freight rate structure to the demand for scrap.
-0- Contains 392 cost/revenue comparisons relating to the compensatory nature of representative or repetitive movements of scrap.
-0- Analyzes cost evidence presented by the parties.
-0- Presents revenue-mileage scatter charts by territory of origin and weight groups.
-0- Presents financial information for the involved railroads.
-0- Examines the relationship of scrap and iron ore in the steelmaking process.
-0- Examines intercommodity cost/revenue relationships between scrap and iron ore.
-0- Examines possible disparities and distortions within the freight rate structure on scrap.
-0- Discusses the possible self-defeating nature of general increases, uneven effects of increases on individual railroads, railroad service, environmental considerations, and other matters.

At times in the report the editorial "we" is used. However, the report is the sole responsibility of the Coordinator and does not necessarily reflect the view of the Commission. Exceptions to the report may be filed in accordance with the Commission's General Rules of Practice and the report will then be considered by the Commission. However, because of the size of the record and the complexity of the issues, the time for filing exceptions will be extended to 90 days from the service date of the report and order. Unless otherwise indicated, rates and costs are shown in amounts per net ton as of September 1, 1973.

PART I
RAILROAD FREIGHT RATE STRUCTURE ON SCRAP IRON AND STEEL

The purpose of part I is to give a detailed analysis of the railroad rate structure on scrap iron and steel. While the term "rate structure" is commonly used, and will be used in this report, it is a fallacy to assume that the railroads have a single freight rate structure on scrap iron and steel or even a single freight rate structure within regions. The railroad rate structures on a particular commodity consist of numerous schedules of charges for rail transportation services. Although these schedules are frequently constructed in conformity with a particular rate scheme, such as on a tapering mileage basis, in most instances the basis or bases for the rates is obscure and, if known, that knowledge is generally limited to the ratemaking railroad or to the most sophisticated tariff expert.

In order to understand the rate structure, it is necessary first to have some background of understanding in regard to the industries involved. As a result, the first two sections of this part are designed to present a general overview of the production and consumption of scrap iron and steel. For the most part, the figures and narratives presented will deal with national or regional situations.

The third section of part I is concerned with the actual transportation of scrap iron and steel. Patterns of movements, relationships of rates to commodity values, rate structures by territory, revenue/cost analysis, and other financial data will be presented in order to offer the most complete picture possible of the freight rate structure on scrap iron and steel as it currently exists. Analysis of this data will begin in this part and will be continued in later parts of the report.

Part I—Railroad Freight Rate Structure on Scrap Iron and Steel
(A) Production of scrap iron and steel
(1) Sources of scrap iron and steel

Iron and steel scrap, Standard Transportation Commodity Code (STCC) 40 211 and Special Projects Counsel (SPC) No. 118, is used in furnaces and foundries as a source of iron for making raw steel, steel and iron castings, and over the last 25 years has provided approximately 50 percent of the metallic input of iron and steel with pig iron, produced mainly from iron ore, providing the remainder. It is graded according to source, cleanliness, iron content, and size. Consumers prefer scrap with a known composition and a known source and sellers are ordinarily required to abide by specifications promulgated by the Institute of Scrap Iron and Steel, Inc. (IS/S). Prices are set in accordance with those specifications in order to provide consistent grading of scrap and facilitate commercial transactions. While ISIS has developed 140 separate grades of scrap, the Bureau of Mines has consolidated the grades into 13 classifications shown in table 1.

TABLE 1

GRADES OF SCRAP IRON AND STEEL

Carbon steel:

- Low phosphorus plate and punchings
- Cut structural and plate
- No. 1 heavy melting steel
- No. 2 heavy melting steel
- No. 1 and electric furnace bundles
- No. 2 and all other bundles
- Turning and borings
- Slag scrap (Fe. content)
- Shredded or fragmentized all other carbon steel scrap

Stainless steel
Alloy steel (except stainless)
Cast iron (includes borings)
Other grades of scrap

Source: Minerals Yearbook.

Iron and steel scrap availability studies normally divide the scrap universe into three distinct sources. The first is generally titled recirculating or home scrap. This type of scrap is a natural byproduct of the iron or steelmaking industry and by definition normally recirculates within the iron or steelmaking plant in which it is produced or is shipped to another plant within the same company. While no commercial sales transactions occur in an intracompany movement, rail transportation may be required and this will be reflected in waybill samples. On occasion, home scrap is sold to other firms and these transactions are normally handled by a broker. Most home scrap is of very high quality, and is normally prepared by reducing the size of the pieces by breaking. The process is simple and has a very low cost. Home scrap in 1973 approximated 61.6 percent of all scrap used, down from a high of 67.0 percent in 1967. See table 2. This figure may be lessened in the future as continuous casting becomes more common.

TABLE 2

Consumption of home scrap in steel production

Year	Steel industry in the USA[1]		
	Thousands of net tons		Home scrap
	Raw steel produced	Steel shipped	Percent of scrap consumed
1973	150,799	111,430	61.6
1972	133,241	91,805	62.8
1971	120,443	87,038	66.8
1970	131,514	90,798	66.9
1969	141,262	93,877	64.1
1968	131,462	91,856	66.6
1967	127,213	83,897	67.0
1966	134,101	89,995	66.4
1965	131,462	92,666	66.9
1964	127,076	84,945	67.0
1963	109,261	75,555	63.8
1962	98,328	70,552	66.6
12-year average	128,014	88,701	65.4

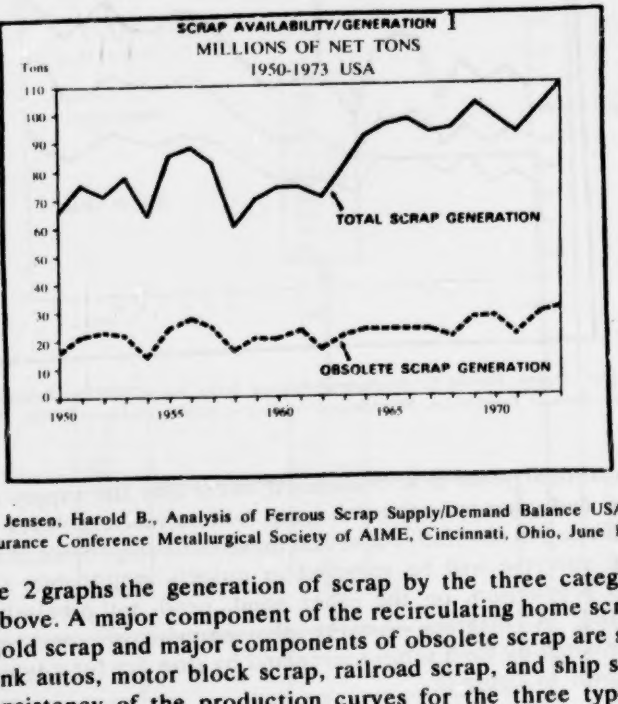
[1] Source: American Iron and Steel Institute Annual Statistical Report.

The second type of scrap is purchased scrap and is generally titled prompt industrial scrap. It may be defined as a byproduct of the primary consumers of iron and steel. It has a known consistency and source, is normally shipped directly back to the steelmaker for recycling, or is sold to another steelmaker by a broker and constitutes 16 percent of all scrap used.

The third major type of scrap is a second class of purchased scrap titled obsolete scrap. This type, constituting 24 percent of all scrap used, may be defined as scrap usable in the iron or steelmaking process that has been obtained by processing obsolete consumer or capital items. Unlike home scrap and prompt industrial scrap, obsolete scrap normally is collected by processors in the vicinity of any major population or industrial area without regard to the location of steelmaking or using plants and is shipped to the plants after commercial transactions through brokers.

Figure 1 graphs the total scrap generated in the United States from 1950 through 1973. It also graphs the total obsolete scrap generated during that same period. As it is apparent that obsolete scrap normally constitutes 20 to 30 percent of the total scrap generated in the country and as it appears likely that home scrap and prompt industrial scrap supplies are normally fixed by the extent of steel production in any given year, relationships noted in future sections between the price of scrap and the availability of scrap should be considered to reflect primarily the price elasticity of obsolete scrap.

FIGURE 1

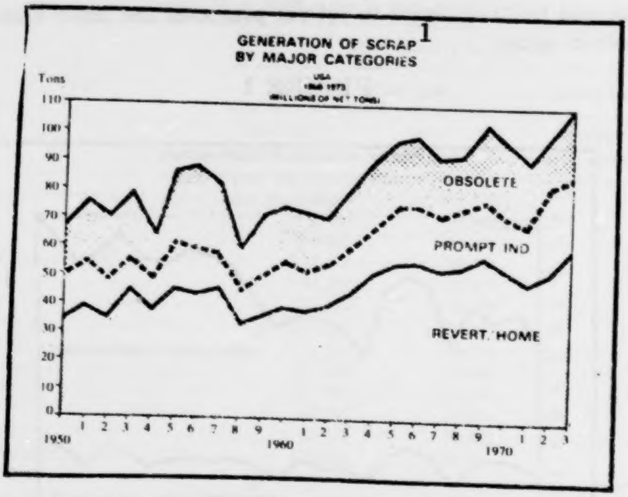


---

[1] Source: Jensen, Harold B., Analysis of Ferrous Scrap Supply/Demand Balance USA, 31st Electric Furance Conference Metallurgical Society of AIME, Cincinnati, Ohio, June 1974.

Figure 2 graphs the generation of scrap by the three categories noted above. A major component of the recirculating home scrap is ingot mold scrap and major components of obsolete scrap are scrap from junk autos, motor block scrap, railroad scrap, and ship scrap. The consistency of the production curves for the three types of scrap should also be noted in regard to the later discussions of price elasticity.

FIGURE 2



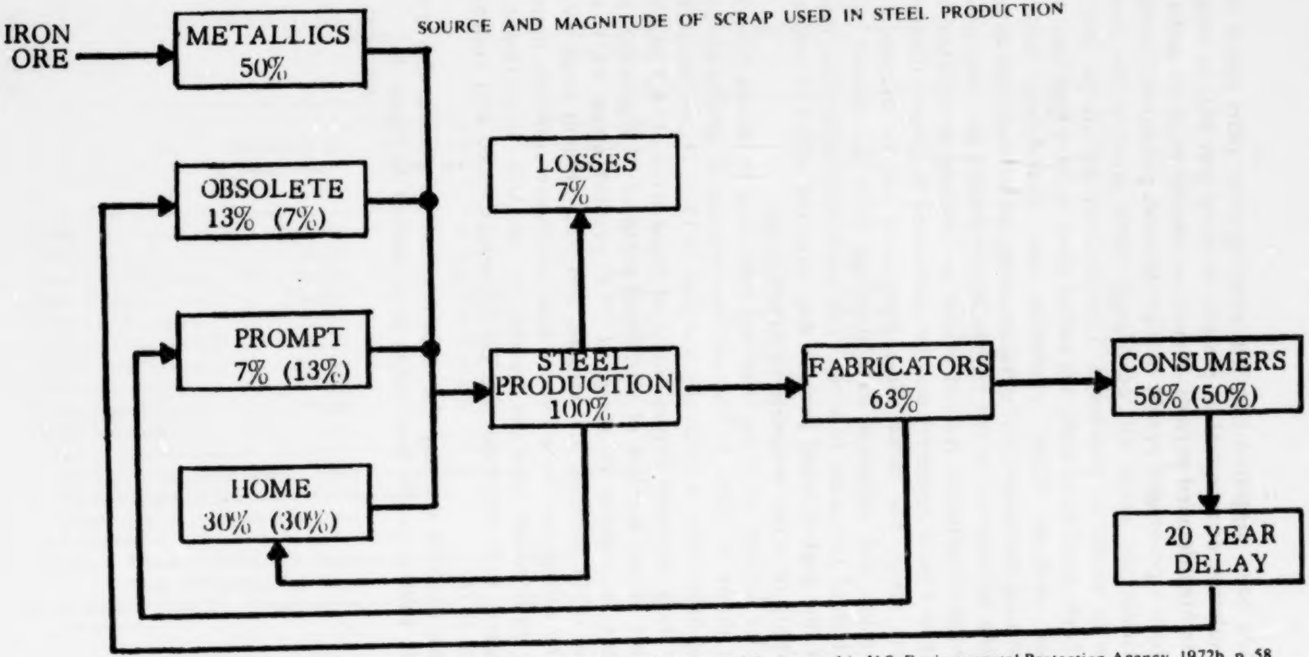
Source: Jensen, Harold B., Analysis of Ferrous Scrap Supply/Demand Balance USA, 31st Electric Furnace Conference, Metallurgical Society of AIME, Cincinnati, Ohio, Revised June 1974.

In normal years it is considered likely that the supply of home scrap and prompt industrial scrap will reflect the level of steel production in the Nation and that these two components of the total scrap universe will be recycled as quickly as possible. Obsolete scrap production, on the other hand, need not precisely follow demand. A diagram showing the percent of total metallics contributed by each scrap source and by iron ore for a typical year is shown in figure 3.

It is interesting to note that only 56 percent of the metallics input to the steel production process reaches the consumer in any given year. Obsolete scrap accounts for only 13 percent of the input metallics. When compared to the steel reaching the consumers, this amounts to only a 23-percent recycling rate. However, when one adjusts for export and compares the amount of obsolete scrap recycled to the amount reaching the consumer 20 years earlier, the amount of obsolete scrap recycled is equal to 47 percent of the scrap generated.

FIGURE 3

SOURCE AND MAGNITUDE OF SCRAP USED IN STEEL PRODUCTION


IRON ORE
METALLICS 50%
OBSOLETE 13% (7%)
PROMPT 7% (13%)
HOME 30% (30%)
LOSSES 7%
STEEL PRODUCTION 100%
FABRICATORS 63%
CONSUMERS 56% (50%)
20 YEAR DELAY

NOTE: Percentages based upon data developed from generalized input/output model presented in U.S. Environmental Protection Agency, 1972b, p. 58 (Table el). Numbers in parentheses are based upon data presented in Regan, W.J., R.W. James and T.J. McLeer, 1972, p. 76.

Source: 13

It has been suggested that low scrap demand years result in an accumulation of marginal or peripheral scrap that will be brought forth in high-demand periods. If such accumulation is not sufficient to supply a prolonged period of high demand, prices will continue to escalate and scrap will be brought forth prior to the time it otherwise would be processed. This assumes, of course, that the same basic sources of scrap are called upon in both high- and low-demand periods. Great confusion and uncertainty exist in determining the quantity of obsolete scrap realistically and actually available because all of the figures are estimates and vary greatly with what is included. An old bridge or building or wrecked cars serving as a parts inventory may be considered in some estimates as obsolete scrap, but those same items may not be available for preparation and shipment to consuming mills for several years, regardless of the price of scrap. The premature collection theory asserts that high-demand periods may have the effect of lessening the supply of scrap available in future years.

A sales picture for scrap iron and steel may be drawn from the figures shown in table 3. The current upswing in production and demand began after a cyclically low year in 1971. Preliminary 1973 figures show increases in production of home scrap of 16.5 percent, increases in net receipts of purchased scrap of 31.2 percent, and increases in exports of scrap of 79.9 percent since 1971 and increase of 12 percent, 3.5 percent, and 52.5 percent since 1972. With the exception of the export sales which are currently limited to 2.1 million net tons per quarter by the U.S. Department of Commerce, it is expected that the increases noted will continue through 1974.

A flow diagram showing the steps required to transfer the scrap from its source to the final users is presented in figure 4.

TABLE 3

Supply of iron and steel scrap available for U.S. consumption and export
(Thousands net tons)

	Production of home scrap	Scrap users' net receipts (purchased scrap)[1]	Total new supply available for U.S. consumption[2]	Plus exports	Total U.S. supply	Total sales[3]	Exports as percent of	
							Total sales	Total U.S. supply
1966	55,463	36,671	92,134	5,858	97,992	42,529	13.8	6.0
1967	53,312	32,654	84,906	7,635	92,601	40,289	19.0	8.2
1968	53,545	33,587	87,132	6,572	93,704	40,159	16.4	7.0
1969	56,287	36,929	93,216	9,176	102,392	46,105	19.9	9.8
1970	52,575	34,148	86,723	10,365	97,088	44,513	23.3	10.7
1971	49,177	32,870	82,047	6,256	88,303	39,126	16.0	7.1
1972	51,184	41,661	92,845	7,383	100,228	49,044	15.1	7.4
1973	57,301p	43,121p	100,422p	11,256	111,678p	54,377p	20.7	10.1
1974, 3 months	13,618	10,762	24,380	2,446	26,826	13,208	18.5	9.1
1974, 5 months	----------	----------	3,790	----------	----------	----------	----------	

[1] Receipts minus scrap shipped, transferred or otherwise disposed of.

[2] Stock changes are not taken into consideration.

[3] Scrap users' net receipts plus exports.

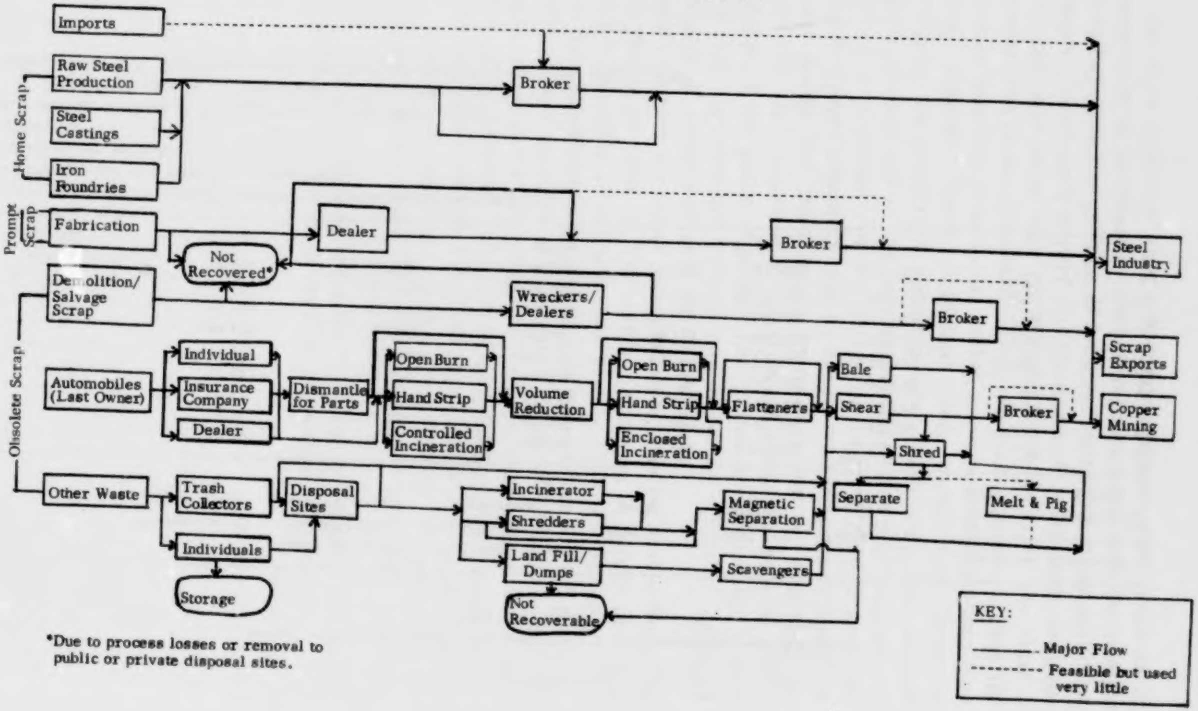
P Preliminary

Source: Bureau of Mines, U.S. Department of Interior—supply.
Bureau of Census, U.S. Department of Commerce—exports.

Compiled by the U.S. Department of Commerce, Materials Division, BDC (April 1974).

FIGURE 4

FLOW DIAGRAM OF SCRAP INDUSTRY


Sources
Imports
Raw Steel Production
Steel Castings
Iron Foundries
Home Scrap
Fabrication
Prompt Scrap
Demolition/ Salvage Scrap
Automobiles (Last Owner)
Other Waste
Obsolete Scrap
Broker
Dealer
Not Recovered*
Broker
Wreckers/ Dealers
Broker
Individual
Insurance Company
Dealer
Dismantle for Parts
Open Burn
Hand Strip
Controlled Incineration
Volume Reduction
Open Burn
Hand Strip
Enclosed Incineration
Flatteners
Bale
Shear
Shred
Broker
Separate
Melt & Pig
Trash Collectors
Individuals
Storage
Disposal Sites
Incinerator
Shredders
Land Fill/ Dumps
Not Recoverable
Magnetic Separation
Scavengers
Steel Industry
Scrap Exports
Copper Mining
KEY:
Major Flow
Feasible but used very little

*Due to process losses or removal to public or private disposal sites.

Part I(A)(2): Obsolete scrap production

Obsolete scrap varies considerably in quality, from very high quality scrap originating from railroad parts to very low quality scrap associated with urban wastes. In 1959, ISIS sponsored a study to classify recycled obsolete scrap in terms of its originator (and, therefore, to a certain degree its quality). Restructuring the categorization used in the ISIS study to reflect scrap quality and modifying the results to more closely reflect current conditions resulted in the following two groups of obsolete scrap:

a. High quality—28 percent.
b. Low quality—72 percent.

High quality scrap originates primarily from railroads, demolition projects, and shipwrecking operations. This scrap requires relatively little processing, has a known composition, and has very small percentages of contaminants. Low quality scrap, on the other hand, requires a large amount of effort to collect and process, has significant amounts of contaminants, and, in general, consists of metals of unknown composition.

Obsolete scrap has also been divided into three major categories, reflecting the quality of the scrap and the importance of the scrap available from each source. The first type is referred to above as high quality scrap and is characterized by high value and relatively low processing costs. Most of this scrap is returned to the steel industry via dealers and broker interactions.

The second source of obsolete scrap is abandoned or dismantled automobiles. The process of returning the average 3,050 pounds of ferrous scrap from automobiles to the steel industry involves a rather complex set of procedures. Briefly, an automobile will go through some combination of the following steps:

1. dismantling for parts; (2) dismantling for processing by open burning, hand stripping, or enclosed incineration; and (3) a baling, shredding, or shearing process.

Because the automotive industry is typically the largest consumer of steel, approximately 20 percent of the total output, obsolete automobile scrap represents a prime source of scrap for recycling.

The third major source of obsolete scrap is a broad category called "other waste." This category includes urban waste and all other disposals of ferrous materials by individuals. At present, urban waste is collected by trash collectors and disposed of primarily in land fills. The increasing but still few examples of processing urban waste are relatively small and at present are insignificant as a source of scrap. Obsolete scrap collected from "other waste" requires significant amounts of processing and at present has a very low quality and resultant low value.

Most studies of scrap iron and steel concern themselves with percentages of large numbers reflecting total scrap consumption that leave the impression that a difference of a few million tons of scrap really does not mean much as it is only a small percentage of our total consumption. However, as noted above, obsolete scrap, the keystone of most environmental discussions, only provides roughly one-quarter of the scrap consumed in this country. Obsolete scrap is the only part of the scrap supply that is not automatically generated as a result of steel production and consumption. Obsolete scrap supply may be increased through intensified efforts in reclamation or through higher prices to attract more of the existing supply.

It should be noted that discussions regarding obsolete scrap production are made difficult as a result of the lack of hard data available and the vast number of variables that affect published statistics. Initially, the "supply" of scrap available for recycling as obsolete scrap is unknown. While vast amounts of iron and steel scrap are potentially recoverable, the collection and processing necessary to prepare a usable product significantly reduces the amounts that are economically recoverable.

The suggestion made by the scrap-producing industry is that higher prices alone will create the economic incentive necessary to expand production of obsolete scrap. Stated in terms of economic analysis, the theory is that there is an elastic supply and price relationship that will be reflected in higher output as prices increase. Again, this is a difficult suggestion to prove analyticially. While prices paid for scrap are known, the effect prices have on production and sales are not easily established. Because scrap processors and steelmakers retain inventories and adjust the size of the inventories in accordance with their own perceptions of future prices of scrap and demand for steel, even a comparison of prices and sales would not give a true price elasticity picture.

The scatter diagram shown in figure 5 was calculated to show the relationship between prices and scrap availability between 1964 and October 1973. The curve shown is a statistically established curvilinear relationship between price and volume. There is clearly not a perfect fit but with certain assumptions there is statistical significance in the curve. It shows that volume responds better to price changes when prices are low than when prices are high. In October and November of 1973, price changes were in $5 jumps but supply did not respond. The fact that the curve tends to bend back slightly at high prices lends some credence to the theory that lengthy periods of high demand for scrap, reflected in high prices, will tend to pull available scrap supplies prior to the time they would ordinarily be made available, causing a lessening of available supply in the future.

FIGURE 5

Relationship between Monthly Obsolete Scrap Supply (OCO's Net Tons) and 3 City No. 1 Heavy Melting AMM Composite Price

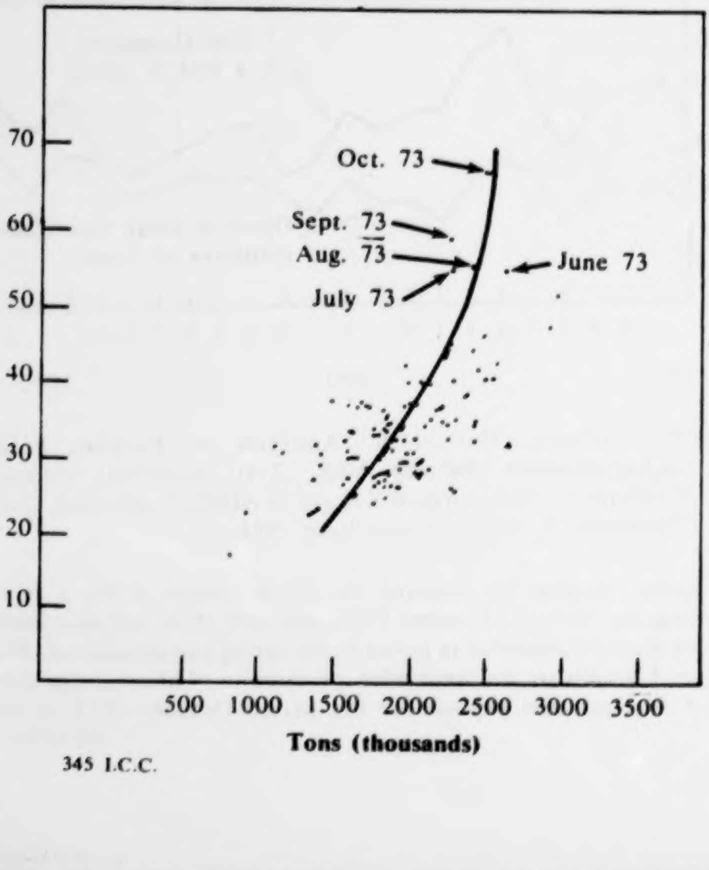
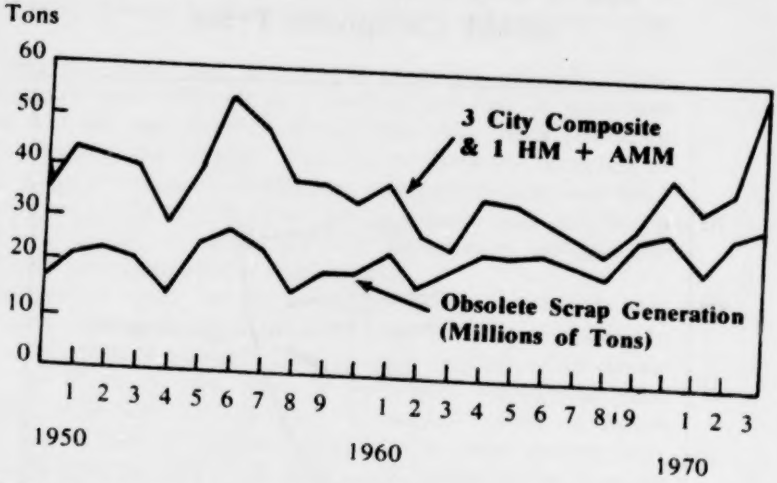


Figure 6 demonstrates that very little additional scrap is generated in the years of high scrap prices. The steel industry and eventually the consumer pay a high total price for the small amount of additional obsolete scrap generated when scrap prices are high. The high prices apply to all purchased scrap, including the amount that would have flowed at low prices.

FIGURE 6

Obsolete Scrap Generation and 3 City No. 1 HM Scrap Composite Price - AMM 1950-1973



Source: Jensen, Harold B. **Analysis of Ferrous Scrap Supply/Demand Balance USA,** 31st Electrical Furnace Conference, Metallurgical Society of AIME, Cincinnati, Ohio, December 5, 1973, revised June 1974.

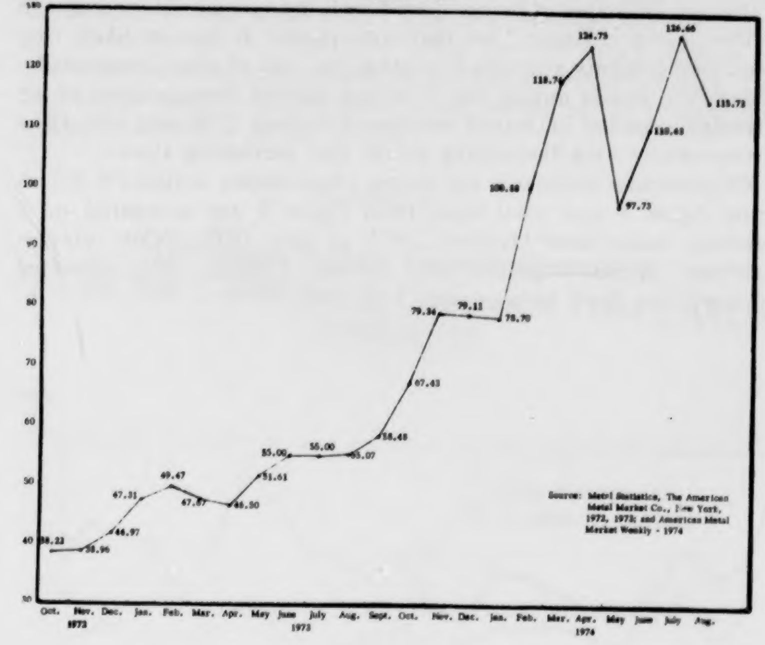
Figure 7 graphs the dramatic rise in the prices of No. 1 heavy melting steel between October 1972 and April 1974, and also graphs the extreme fluctuations in prices in the spring and summer of 1974. Figure 8 graphs stocks, total sales, production of home scrap, scrap users receipts, and exports for the period October 1972 to July

1974. The sharp decline in stocks for the period August 1973 to February 1974 should be compared with the substantial increases in prices shown in figure 7 for that same period. It appears likely that purchasing agents attempted to stem the tide of price increases by using their stocks during that 6-month period. Having failed in the attempt, receipts increased between February 1974 and May 1974 concurrently with fluctuating prices and increasing stocks.

Of particular interest is the scatter chart shown in figure 9. Prices from figure 7 and total sales from figure 8 are compared on a monthly basis from October 1972 to July 1974. While precise analyses of such graphs are always difficult, the following observations have been made.

FIGURE 7

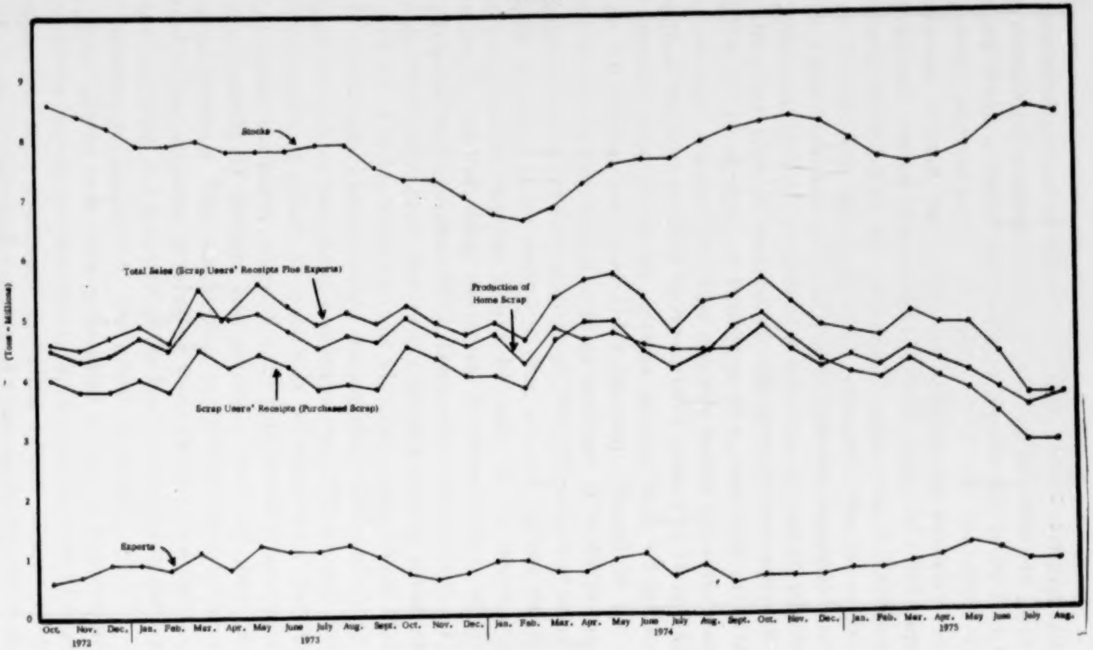
No. 1 Heavy Melting Steel
Composite Scrap Steel Prices Per Gross Ton
Pittsburgh, Chicago and Philadelphia



Source: Metal Statistics, The American Metal Market Co., New York, 1972, 1973; and American Metal Market Weekly - 1974

FIGURE 9

Iron and Steel Scrap Supply and Sales[1]
(Net Tons)
(Millions)



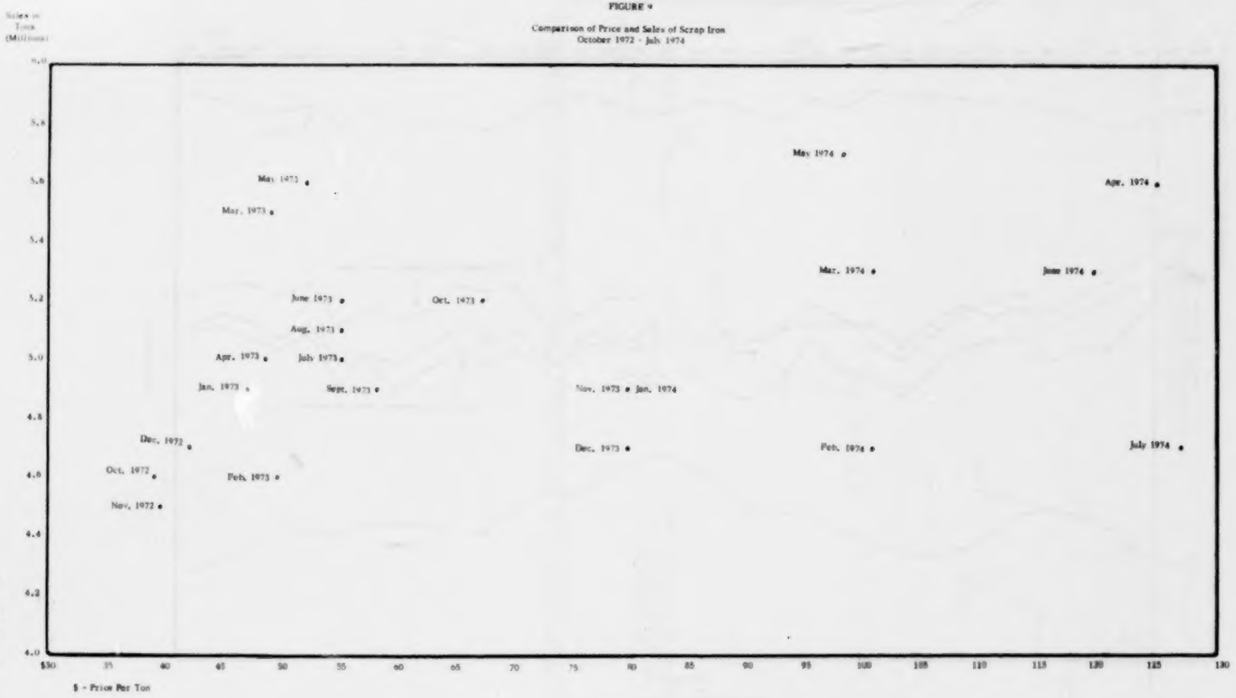
Source: Mineral Industry Surveys, U.S. Department of the Interior, Bureau of Mines, Washington, D.C., October 1972-August 1975.

---

[1] Preliminary data based on 81 percent return of reporting consumers
Sales = Receipts plus Exports
Production of home scrap = Recirculating Scrap plus Obsolete Scrap
Receipts = From Dealers, Own Company Plants, and Other Sources

FIGURE 9

Comparison of Price and Sales of Scrap Iron
October 1972 - July 1974



An extended period of historically high prices and demand has almost completely negated any direct correlation between price and total sales. While a traditional elasticity picture may be derived from the points representing October 1972 to October 1973, relationships beyond that point are difficult to perceive. In the former period, a price increase from $38.22 to $67.43 (76.4 percent) was closely followed by an increase in sales from 4.6 million net tons to 5.2 million net tons (13.0 percent). Stated in another manner, a price increase of $4.87 per net ton was required to attract each additional 100,000 pounds of scrap. It is, of course, possible to make the same type of analysis for the period November 1973 to July 1974, if the months of February, May, and July of 1974 are viewed as mere aberrations. This analysis would show increases in prices from November 1973 to April 1974 from $79.34 to $124.75 (57.2 percent) followed by an increase in sales from 4.9 million net tons to 5.6 million net tons (14.3 percent). Stated in the same manner as the earlier period, a price increase of $6.49 per net ton was required to attract each additional 100,000 pounds of scrap. The difficulty with the latter period is that, viewed against the former period, almost all months could be said to be aberrations as illustrated by the following examples. Receipts of 4.7 million net tons occurred in December 1972, December 1973, February 1974, and July 1974. However, the prices quoted during those months were $44.97, $79.11, $100.88, and $126.66, respectively. Receipts of 5.6 million net tons occurred during May 1973 and April 1974 although the prices for those 2 months were $51.61 and $124.75. Other examples of a lack of sensitivity between price and receipts abound within the scatter chart. Closer relationships appear to exist between months of receipt and amounts received than between price and amounts. This would seem to indicate that, within ranges dictated by the amounts of scrap on hand and the demand for steel, demand for scrap is a function of cyclical variations in the iron and steel industry as opposed to the price of scrap.

If higher prices have only a marginal effect on improvements in the available supply of obsolete scrap during periods of high steel consumption, then increased recycling efforts appear to be the primary hope of increased supplies of scrap in the future. A detailed summary of the programs and technological advancements that have been attempted toward this end would be beyond the scope of this proceeding. However, a brief mention of some of these advances may be worthwile. In the case of the junk automobile, the invention of the scrap shredder and the portable car-flattener has made it possible to create higher quality scrap with fewer contaminants in a reduced time. Among other technologies presently being evaluated are cryogenic scrap processing which could be used for auto hulks and appliances to produce very high quality scrap and flotation and air separation techniques being applied to urban wastes.

Project PRIDE, instituted by the Chicago and North Western Railroad, has also experienced notable success. Essentially, project PRIDE initiated a service for the movement of crushed automobile hulks from a variety of rural origin points to scrap-processing plants. This service consists of the scheduled placement of modified gondola cars at origin points and single-line movement to processing plants, mainly in the Chicago Switching District. Also included as destination points are Minneapolis and Milwaukee where further processing occurs and the scrap is forwarded to consumption points. Between May 1, 1972, and April 30, 1974, a total of 831 carloads moved between eight origin and five destination States in the Midwest. Project PRIDE is considered a model for future programs for bringing partially processed scrap by rail to the scrap processor's facilities.

It is clear that the technological improvements and railroad-initiated programs noted can have only limited success in eliminating from our environment the unsightly auto hulks that litter highways and the countryside. In times of high scrap prices the private salvage and scrap dealers have been somewhat successful in removing automobile hulks from urban areas. However, recurring problems are experienced in at least two areas. First, in most States a gamut of paperwork must be run in order to secure title to abandoned hulks. Second, in rural areas the collection of abandoned vehicles simply is not profitable for the salvage dealer even during periods of high scrap prices.

What seems to be needed in this area are State and Federal Government programs designed to ease the title and collection process. Such programs would provide the twofold benefit of cleaning up our land and adding to the suppy of usable ferrous scrap. Numerous programs along these lines have already been established. The Junk Car Demonstration Program of the Tennessee Valley Authority has design drawings for junk car collection vehicles that are available at no charge to interested parties. Chattanooga, Tenn., and Asheville, N.C., have constructed such collection vehicles for use in their areas.

California has embarked on a $15 million program financed by a one-time assessment of $1 against every motor vehicle registered in the State. In the first year of the program, 32,000 abandoned vehicles were removed at an average cost to the State of $24 per vehicle, including administrative overhead under the abandoned vehicle abatement program. Pennsylvania is currently funding three pilot projects under the abandoned auto removal program of the Pennsylvania Department of Community Affairs. In addition, Maryland, Montana, Hawaii, Illinois, Minnesota, and North Dakota all have ongoing abandoned vehicle abatement programs.

Legislation has been proposed in the first session of the 94th Congress, H.R. 1238 and H.R. 4211, to encourage States to establish motor vehicle disposal programs and to provide for federally guaranteed loans and tax incentives for the acquisition of automobile scrap processing equipment. These bills, as well as the State and local programs we have mentioned above, are significant on two levels. First, they point out the increased concern being shown for the need to clean up our environment and make use of the potentially recyclable ferrous scrap littering our highways. Second, and equally important for purposes of this proceeding, they are evidence of the realization of the fact that the environmental problems caused by abandoned vehicles cannot be solved by private industry alone.

While arguments have been made that project PRIDE exemplifies a type of program that can be instituted by the railroads to solve the cleanup problem and to increase recycling of ferrous scrap, these arguments are only partially correct. Project PRIDE was not a charitable operation by any means. The freight rates charged for the movement of the flattened vehicles involved were fully compensatory. This type of program, while commendable, cannot take the place of not-for-profit programs needed to get the job done. We do not mean to suggest that the railroads should sponsor such charitable programs. On the contrary, as the railroads' sole function in the scrap recycling process is to transport large amounts of scrap either to the scrap processor or, most often, to the scrap consumer, they do not have the resources or expertise needed to pick up the individual hulks that create the environmental problems. The railroads' role in the movement of scrap is to provide fast and efficient transportation for processed or semiprocessed scrap. We should not ask them to assume a greater role for which they are not equipped. In the event, however, that future technological changes occur which render scrap more competitive with iron ores, appropriate considerations should, of course, be afforded under the circumstances at that time.

Part 1(A)(3): Scrap marketing

While little substantive marketing information has been provided directly by the pleadings in this subnumbered proceeding, the information provided, supplemented by other sources, allows brief comments to be made concerning the effects of the marketing structure on the overall transportation picture.

There are three major functional groups in the iron and steel scrap industry. The first group collects the scrap and is primarily comprised of low-volume entrepreneurs who collect scrap materials for profit within limited geographic areas surrounding their base of operations. A secondary collection source is comprised of civic groups who organize and operate recycling drives and centers for purposes of ecological betterment of their communities or fund raising. The obsolete scrap collected by these sources is normally trucked either to junkyards for sorting and assembling or directly to the next major group in the chain, the scrap metal processors.

According to ISIS, there are about 1,800 of these processors located throughout the country but clustered around large urban areas. Processors are the core of the scrap industry and deal primarily with obsolete scrap. Processors receive scrap from collectors, junkyards, municipal waste reclamation facilities, and auto wreckers. The processors then bundle, shred, or otherwise prepare the scrap for consumption by steel mills. They may have direct selling arrangements with particular steel companies or be owned by steel companies but the extent of these arrangements is small in comparison to the extent of analogous arrangements in iron ore marketing. Primarily, processors sell their products through the third link in the chain, the brokers.

ISIS further states that approximately 200 full-time brokers exist in the United States, three-quarters of which are both processors and brokers. Brokers may occasionally have contracts with steel companies, agreeing to provide certain quantities of the various types of iron and steel scrap required over a 60-day period, but the operation of the scrap market is considered hampered by the reluctance of steel companies and/or brokers and processors to enter into long-term contracts. Thirty-day contracts are more typical of the industry as the practice is generally to "buy the melt," that is, buy what is needed to produce the amount of steel on order. The market may also be hindered by the lack of any type of futures market but it is probable that the limited number of buyers for the commodity would make operation of such a market impossible.

Using their own processing facilities and purchasing scrap from other processors, the brokers arrange the delivery of relatively large quantities of obsolete scrap to the steel mills. As noted previously, brokers also participate in intercompany movements of a limited amount of home scrap as well as a somewhat larger number of prompt industrial scrap sales. A broker, in most instances, does not actually see or handle the scrap he sells and this is particularly true for the prompt scrap which is usually shipped directly from the fabricator to the steel mills.

In later sections the transportation characteristics of scrap iron and steel will be explained in more detail but the general outlines of these movements should be noted at the outset.

As a result of the relatively large number of processors and the relatively small number of consumers for scrap, the brokers perform the necessary function of compressing the supply pool to fit the demand pool. However, while this function is performed well in terms of the number of contracts the steel industry must sign, it does not alter the transportation patterns. These patterns show a large number of shippers each originating a relatively small amount of scrap in single-car movements at irregular intervals to a smaller number of consignees. As origins, destinations, and amounts moved are not constant, car supply problems are multiplied as demand cannot be anticipated and cars may not be dedicated to the involved service.

While this pattern may not be accurate for all shippers in that in individual cases there is more regularity of movement, it does appear to be an accurate picture for the overview and helps to explain the service problems discussed in a later section and the increased cost of service to the carriers.

Part 1(A)(4): Environmental considerations in production.

As a recycled commodity, iron and steel scrap possess many favorable characteristics. First, and most important, the reuse of the iron elements of the scrap preserves our natural resources by reducing the need to mine iron ores and the other natural elements necessary to produce iron and steel. Second, and of increasing importance, recycling of scrap improves the environment by removing unsightly litter from the landscrape. Third, a function of the increased value of scrap is that it will allow programs to be developed and expanded in the area of reclaiming scrap waste from municipal trash collection centers thereby reducing the amounts of land necessary for the disposal of that waste. Thus, although the

Commission should do nothing to discourage recycling efforts, the magnitude of the competition between scrap iron and steel and iron ores at this time and on this record is insufficient to warrant the application of holddowns in all instances.

For purposes of describing pollution caused by scrap production, the system can be separated into two functional areas—collection and processing. Transportation pollution will be mentioned separately.

For home scrap and most prompt and high-quality obsolete scrap, the collection and processing occurs as an integral part of normal housekeeping or demolition procedures. Therefore, recycling the scrap does not have a significant effect on the pollutants created by performing these functions.

Recycling low-quality obsolete scrap, primarily auto hulks, does result in additional pollutants. Pollutants from trucks used for collecting and transporting the scrap to the dealers and pollutants resulting from incinerating, shredding, shearing, et cetera, would not occur if the hulks were left at the junkyard or disposal site.

The principal negative environmental effect of scrap transportation is derived from the trucking of obsolete scrap to processors. A recent report stated that 71 percent of all junked autos are moved less than 50 miles to the processor and 86 percent requires less than 100 miles to transport them to the processor.[1]

In the near future, no major changes are anticipated in scrap collection and processing; however, it is expected that incineration of junked material will be less common as Federal and State air pollution laws become more stringent.

If recycling maintains its current high levels and greater average distances are encountered in transporting scrap material to the processor, increases in both energy use and emissions will occur. On the other hand, if greater numbers of processing sites are opened as a result of increased recycling activity, average truck transportation distances may decrease and less energy usage and emissions will occur as a result of scrap collection.

Scrap collection and processing produce only air pollutants. Data were obtained for incineration and shredding of auto hulks and the collection of these hulks. The emissions shown in table 4 as generated from truck collection of auto hulks were based upon data presented by Adams,[2] i.e., average distance is 64 miles, and average weight of a hulk is 3,050 pounds. These data, in conjunction with truck emission data presented later, provide the basis for calculating emissions resulting from the collection of auto hulks. For policies which increase scrap consumption, these estimates are conservative since increases in the consumption of scrap may increase the distance associated with the collection of scrap. This in turn will increase the pollutants generated in performing this function.

---

[1] Adams, R.L., *An Economic Analysis of the Junk Automobile Problem*, U.S. Bureau of Mines, Washington, D.C., 1973.

TABLE 4

Controlled air emissions and energy consumption for collection and processing of obsolete scrap

Process	Air emissions (pounds/auto hulk)					Energy	Data sources[4]
	Particulates	SO_x	NO_x	CO	Other		
Collection (truck)	.041	.051	.82	.44	[1].072	215.2	8 and 29
Processing-incineration	1.5-2		.02-.1	0-2.5	[1]0-.5		29
					[2].06-.2		
					[3].4-.3		
Shredding						421.7	16

[1] Hydrocarbons
[2] Aldehydes
[3] Organic acid
[4] Numbers refer to references at end of report
Source: Final Environmental Impact Statement

Part I(B)(1): Consumption of scrap iron and steel figures and trends (domestic and export).

As noted above, modern steelmaking requires the use of both recycled iron and steel scrap and virgin iron ore for the production of steel. The proportion of scrap and ore inputs to the steelmaking "heat" varies with the processes used to produce the steel (see *infra*). The shortrun demand for scrap is a function of the demand for steel, the processes used in producing the steel, the blast furnace capacity for producing pig iron, and, within limits previously discussed, the price of scrap.

As explained in the section describing the steel industry, *infra* at 59, the various processes used for producing steel have theoretical ranges of scrap charges. The amount of scrap used can be adjusted as long as the ranges specified by the theoretical limits are not violated. The total scrap demand, therefore, is dependent upon the mix of processes used in the total production process and the total demand for steel. If demand for steel is normal or low, the amount of scrap used would normally be closer to the lower limits of the scrap/pig iron production possibility curve.

---

[2] Id.

Demand for scrap is also related to blast furnace capacity. Blast furnaces require a large capital investment and a significant startup cost. Therefore, once in an operating condition, it is desirable, from the steel companies' point of view, to keep them operating as close to capacity as possible. We note that, while the total number of blast furnaces has declined by 21 since the end of 1968, the number in use increased by 41 from the end of 1971 to the end of 1973. When demand for steel is low and blast furnace capacity is relatively high, pig iron usage increases relative to scrap usage. On the other hand, if blast furnace capacity is relatively low in comparison to the demand for steel, scrap usage increases faster than pig iron usage. Both situations have occurred in the past decade. In the middle sixties, the low price and low consumption of scrap were caused in part by an excess blast furnace capacity relative to steel production. During recent years, however, the reverse has been true. The blast furnace capacity was not capable of meeting the requirements for the level of desired steel production. Therefore, increases in the percentage of scrap used in the various steel producing furnaces were observed. These increases in percentages resulted in an increase in total consumption of scrap and, therefore, an increase in the price of scrap.

In addition to the factors described above, the long-range demand for scrap will be a function of the development and implementation of new technologies such as continuous casting, preheating of scrap for basic oxygen furnace charges, and electric furnace charges, and prereduced ore.

Continuous casting reduces the amount of home scrap and, therefore, should increase the demand for prompt and obsolete scrap. Preheating scrap permits the scrap charge in basic oxygen furnaces to increase from an average of 29 percent to a theoretical maximum of around 50 percent. The use of preheating, therefore, would increase the demand for scrap since more scrap could be used in the charges of the basic oxygen furnace. Similar results for preheating scrap in electric furnaces would not result, because electric furnaces in general are presently charged at 98 percent scrap. In the near term, scrap preheating in an electric furnace may increase capacity by reducing the heat time. If capacity is increased, the demand for scrap will be increased. In the long term, preheating of scrap for electrical furnaces would change the economics of operating electric furnaces and, if successful, would have an impact upon the growth and development of electric furnaces in the steel manufacturing and steel production process.

The growth of electric furnaces during the past decade has been due in part to the following reasons:

> (a) They provide flexibility for large integrated mills, and (b) they provide a means of locating steel production processes at smaller, so-called minimills, close to product demand and their supply of scrap.

The continued growth of these furnaces will have a significant bearing upon the total demand for scrap in the long run. It should be noted, however, that the minimill concept is based, in part, upon the economic advantages obtained by short circuiting the transportation links to the large integrated mills. Any change in the rate structure for transporting scrap and raw steel will have an impact upon the location economics of the minimills.

Finally, a technological development which will have significant impact on the use and demand for scrap is the development of economically viable prereduced ore which has been accepted as a direct competitor to scrap. If prereduced ore can be developed and manufactured at a price comparable to that of scrap, then it will make significant inroads into the scrap market and thereby reduce the total demand for scrap.

The sections which follow describe the iron and steel industry in terms of production technology. Special emphasis is directed toward the use of scrap and ore in iron and steel production. When viewing the tables and figures presented, it is important to note the exact terminology used. Figures presented as to proportions of scrap inputs in iron and steel production may become confusing unless the distinctions between ore and pig iron and the various types of iron and steel production are kept in mind.

Table 5 lists the raw steel production in the United States since 1966 and the amount of iron and steel scrap and pig iron (made primarily from iron ores) consumed in this production. (Total scrap supply figures since 1966 are shown in table 3 of part I(A)(1). The proportion of scrap iron and steel consumed in steel production has remained relatively constant at between 44 and 48 percent of the metallic charge.

TABLE 5

Raw steel production and consumption of pig iron and scrap in U.S. steelmaking furnaces(1)
(Thousands of net tons)

Year	Raw steel production (2)	Pig iron consumption	Scrap consumption	Proportion of pig iron	Proportion of scrap
1973	150,799	94,935	82,467	53.5	46.5
1972	133,241	84,032	73,415	53.4	46.6
1971	120,443	74,235	63,694	53.8	46.2
1970	131,514	81,047	69.323	53.9	46.1
1969	141,262	84,178	76,641	52.3	47.7
1968	131,462	80,247	70,026	53.4	46.7
1967	127,213	82,850	65,422	55.9	44.1
1966	134,101	86,545	70,127	55.2	44.8

(1) Excludes production by manufacturers who produce only steel castings.

(2) Due to process losses, the summation of pig iron consumption and scrap consumption does not equal raw steel production.

Sources: Steel production: Table 1A
Others from: Table 44
Annual Statistical Report, American Iron & Steel Institute, Washington, D.C., 1973.

Table 6 again shows the total amounts of raw steel produced as well as the amounts of steel shipped and the net tons of scrap iron and steel and iron ore consumed per net ton of raw steel. It should be noted that for the last 2 years shown, 1972 and 1973, the number of net tons of scrap consumed per net ton of raw steel is above the 12-year average and the number of net tons of iron ore consumed per net ton of raw steel is below the 12-year average.

TABLE 6

Consumption of iron ore and scrap in steel production[1]

Year	Steel industry in the USA[2]			
	Thousands of net tons		Net tons per NT raw steel	
	Raw steel produced	Steel shipped	Iron ore consumption	Scrap consumption
1973..........................	150,799	111,430	1.016	0.542
1972..........................	133,241	91,805	1.008	0.534
1971..........................	120,443	87,038	1.013	0.529
1970..........................	131,514	90,798	1.049	0.527
1969..........................	141,262	93,877	1.019	0.543
1968..........................	131,462	91,856	1.026	0.533

Consumption of iron ore and scrap in steel production[1]*—Continued*

Year	Steel industry in the USA[2]			
	Thousands of net tons		Net tons per NT raw steel	
	Raw steel produced	Steel shipped	Iron ore consumption	Scrap consumption
1967	127	83,897	1.047	0.514
1966	134,101	89,995	1.064	0.523
1965	131,462	92,666	1.063	0.531
1964	127,076	84,945	1.075	0.522
1963	109,261	75,555	1.065	0.536
1962	98,328	70,552	1.099	0.520
12-year average.	128,014	88,701	1.043	0.530

[1] Includes ore consumed in blast furnaces, steel-producing furnaces, and agglomeration plants.

[2] Source: American Iron & Steel Institute Annual Statistical Report.

Table 7 shows the total amounts of pig iron produced between 1966 and 1973 and serves to explain the metallic content of the pig iron used in steel production. It should be noted that the phrases "hot metal" and "liquid blast furnace metal" utilized in later sections of the report refer to pig iron in its molten stage. As shown in the table, the proportion of scrap iron and steel used in blast furnaces to produce pig iron has also remained relatively constant at around 4.5 percent.

TABLE 7

Pig iron production and the consumption of scrap in U.S. blast furnaces[1]

(Thousands of net tons)

Year	Pig iron[2] production	Scrap consumed	Scrap consumed as percent of pig iron produced	Iron ores consumed as a percent
1973	100,837	4,344	4.31	95.69
1972	88,942	3,743	4.21	95.79
1971	81,299	3,493	4.30	95.70
1970	91,435	4,120	4.51	95.49
1969	95,017	4,578	4.82	95.18
1968	88,780	4,055	4.57	95.93
1967	86,984	4,218	4.85	95.15
1966	91,500	4,740	5.18	94.82

(1) Excluding ferroalloys.

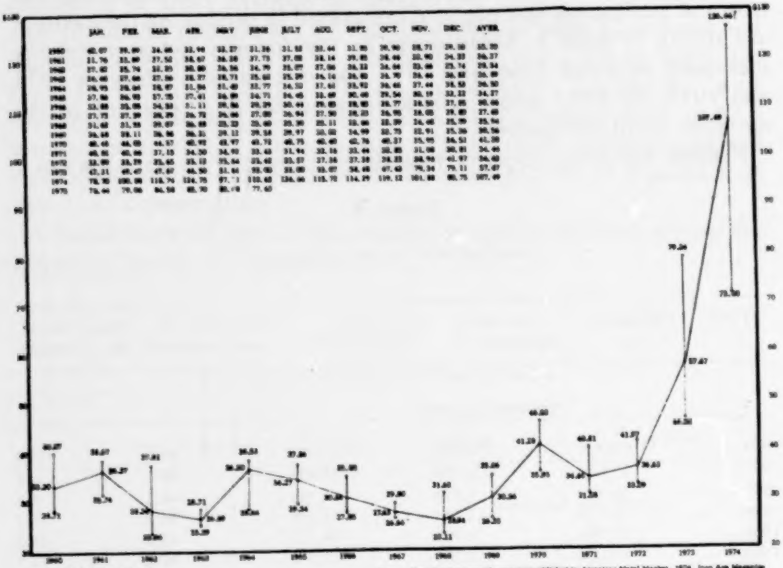
(2) Source: Table 30

Annual Statistical Report. American Iron & Steel Institute. Washington. D.C., 1973.

Figure 10 summarizes the average price per net ton of No. 1 heavy melting scrap in the period from 1960 through the first quarter of 1975. While it should be clearly understood that the price for this type of scrap does not accurately reflect the prices paid for all types of scrap, it does represent the most commonly referred-to figures and is used in this report as representative in a general sense. A further caveat in utilizing scrap prices is that scrap transactions are made daily in approximately 20 markets across the country. The weekly figures often used generally represent the results of telephonic communications between reporters from various publications and their sources in the three basic markets. The monthly figures generally result from the addition of weekly figures and simple division. Figures shown in figure 10 represent the high monthly figure, the low monthly figure and the average of the 12 involved months. As a result, while the overall picture presented is believed to be a fair representation, it is not 100 percent accurate. In a later section when the relationship of scrap prices and rail freight rates is presented, these relationships will be shown for a range of expected scrap prices and a range of freight rates.

FIGURE [illegible]

Composite Scrap Steel Prices
Composite Averages of No. 1 Heavy Melting Steel Scrap Prices at Pittsburgh, Philadelphia, and Chicago, Showing the Annual Range of the Scrap Steel Prices



Source: Compiled from monthly averages published by American Metal Market, 1974, Iron Age Magazine

The shipments of castings from iron and steel foundries and the iron and steel scrap and pig iron consumed in producing the castings are shown in table 8. Scrap usage by the foundry industry steadily increased between 1966 and 1971 and decreased slightly in 1972 and 1973. In 1973 scrap still accounted for 88.7 percent of the metallic input of castings.

Figures for scrap exports have been provided in part I(A)(1).

TABLE 8

Iron and steel foundry shipments

Year	Shipments (1)	Pig iron consumed (2)	Scrap consumed (2)	Proportion of scrap consumed	Proportion of ore consumed
		thousand net tons			
1973	(3)19,970	(4)2,683	(4)21,122	88.7	11.3
1972	17,870	(4)2,194	(4)19,956	90.1	9.9
1971	16,269	1,953	17,948	90.2	9.8
1970	16,529	2,251	16,236	87.8	12.2
1969	18,984	3,016	18,175	85.8	14.2
1968	17,858	2,883	17,034	85.5	14.5
1967	17,225	3,927	18,181	82.2	17.8
1966	19,004	4,565	19,707	82.0	18.0

(1) Source: Department of Commerce, Bureau of Census.

(2) Sources: 22-28

(3) Estimate

(4) Mineral Industry Survey, Final 1973 Statistics, April 1974

Part I(B)(2): Locations of demand

Steelmaking in the United States is concentrated in only a few areas of the country. Historically, the location of steelmaking facilities has depended upon the location of and access to raw materials such as scrap, iron ore, and coal.

Table 10 summarizes the production of raw steel by State. Raw steel is defined as steel in its first solid state after refining in the steelmaking furnace. Nine States account for nearly 87 percent of the total U.S. raw steel production each year.

Iron and steel foundries are located in nearly every State. However, foundry production, like steelmaking, is highly concentrated in only a few States. Table 11 shows the shipments of castings by State in 1971 and 1972. Ten States, New York, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, Alabama, Tennessee, and Texas, accounted for 83.5 percent of all shipments of gray and ductile iron castings and 73.3 percent of all shipments of steel castings in 1972.

Of particular interest are the figures shown in table 12 of State and regional consumption of scrap iron and steel and pig iron. Only five States—Pennsylvania, Ohio, Indiana, Illinois, and Michigan—consumed 63,139,000 net tons of scrap in 1972 or 67.6 percent of total U.S. consumption. These same States consumed 66,735,000 net tons of pig iron in the same year or 74.9 percent of total U.S. consumption.

A breakdown of total consumption by type of furnace shows the following figures for 1972:

TABLE 9

Scrap and pig iron usage by type of furnance

Type of furnace	Scrap	Pig iron[1]
	(thousand net tons)	
Cupola	15,544	2,264
Electric	30,459	961
Open hearth	18,842	22,375
Basic oxygen	24,192	60,232
Blast	3,565	----------
Air and other	787	394
Total	93,371	86,226

[1] Excludes molten pig iron used for ingot molds and direct casting.

TABLE 10

Raw steel production by State
(Thousands of net tons)

State	Production					
	1973	1972	1971	1970	1969	1968
Pennsylvania	33,925	30,416	27,655	30,031	32,791	31,018
Ohio	26,510	23,851	20,064	21,684	24,203	22,606
Indiana	23,622	21,268	17,307	18,528	19,386	17,911
Illinois	13,428	12,152	10,897	11,738	11,873	10,510
Michigan	10,945	9,380	9,069	9,549	10,036	9,218
Maryland[1]	7,612	6,224	6,947	8,296	8,949	8,025
Alabama[2]	4,860	4,812	4,535	5,044	5,115	4,611

Raw steel production by State—Continued
(Thousands of net tons)

State	Production					
	1973	1972	1971	1970	1969	1968
New York	6,401	4,114	4,321	4,824	7,522	7,228
California	4,479	3,562	3,595	4,008	4,244	4,210
Other	19,017	17,462	16,053	16,814	17,144	16,125
Total	150,799	133,241	120,443	131,514	141,262	131,462

[1] Includes small amounts produced in Connecticut. Delaware. New Jersey and Rhode Island.

[2] Includes small amounts produced in Arkansas. Mississippi and Tennessee.

Source: American Iron & Steel Institute, *Annual Statistical Report, 1971*, Washington, D.C., 1972. 1972.

TABLE 11

Shipments of iron and steel castings, and production of steel ingots, by geographic areas: 1972 and 1971
(Thousand short tons)

Division and State	Gray and ductile (nodular) iron castings		Malleable iron castings		Steel castings[1]		Production of raw steel[1]	
	1972	1971	1972	1971	1972	1971	1972	1971
United States, Total	15,328	13,839	961	882	1,596	1,579	133,241	120,443
New England	108	154	14	15	(D)	(D)	(D)	(D)
Maine	1	1	3	7	----------	----------	----------	----------
New Hampshire	----------	----------			(D)	(D)	----------	----------
Vermont	7	11			----------	----------	----------	----------
Massachusetts	57	84			(D)	(D)	----------	----------
Rhode Island	22	34			----------	----------	(D)	(D)
Connecticut	21	24	11	8	11	(D)	(D)	(D)
Middle Atlantic	2,877	2,782	128	118	317	338	(D)	(D)
New York	669	691	18	20	86	76	4,114	4,321
New Jersey	397	399			4	5	(D)	(D)
Pennsylvania	1,811	1,692	110	98	227	257	30,416	27,655
East North Central	7,658	6,664	744	673	703	692	66,651	57,337
Ohio	2,350	1,871	143	137	238	226	23,851	20,064
Indiana	959	904	39	36	51	62	21,268	17,307
Illinois	1,227	1,059	103	98	231	244	12,152	10,897
Michigan	2,695	2,374	412	352	57	42	9,380	9,069
Wisconsin	427	456	47	50	126	118	----------	----------
West North Central	544	554	25	14	166	164	(D)	(D)
Minnesota	116	132	25	14	(D)	(D)	(D)	(D)
Iowa	325	286			(D)	(D)	----------	----------
Missouri	80	104			51	59	(D)	(D)
Nebraska	23	32			(D)	(D)	----------	----------
Kansas					(D)	(D)	----------	----------
South Dakota	----------	----------			(D)	(D)	----------	----------

See footnotes at end of table.

Shipments of iron and steel castings, and production of steel ingots, by geographic areas: 1972 and 1971—Continued
(Thousand short tons)

Division and State	Gray and ductile (nodular) iron castings		Malleable iron castings		Steel castings[1]		Production of raw steel[1]	
	1972	1971	1972	1971	1972	1971	1972	1971
South Atlantic	442	424	(D)	(D)	38	37	(D)	(D)
Delaware	---	---	---	---	(D)	(D)	(D)	(D)
Maryland	78	75	---	---	(D)	(D)	(D)	(D)
Virginia	204	194	---	---	9	7	5,562	4,601
West Virginia			(D)	(D)	9	7		
North Carolina	111	103	(Z)	(Z)	---	---		
South Carolina	26	25	---	---	---	---		
Georgia	18	22	---	---	(D)	(D)		
Florida	5	5	---	---	(D)	(D)		
East South Central	2,457	2,050	(D)	(D)	98	80	7,275	6,826
Kentucky	293	229	---	---	---	---	2,463	2,291
Mississippi	---	---	---	---	---	---		
Alabama	1,744	1,632	(D)	(D)	98	80	[2]4,812	[2]4,535
Tennessee	420	189	---	---				
West South Central	539	499	(D)	(D)	68	r68	(D)	(D)
Arkansas	---	---	---	---	12	19	(2)	(2)
Louisiana	35	30	---	---			---	---
Oklahoma			---	---	56	r49	(D)	(D)
Texas	504	469	(D)	(D)			(D)	2,849
Mountain	313	255	(D)	(D)	(D)	(D)	(3)	(3)
Montana	104	90	---	---	---	---	---	---
Colorado			---	---	(D)	(D)	(D)	(D)
Arizona	209	165	---	---	(D)	(D)	(D)	(D)
Utah			---	---	(D)	(D)	(D)	(D)
Nevada	---	---	(D)	(D)	(D)	(D)	---	---

See footnotes at end of table.

Shipments of iron and steel castings, and producting of steel ingots, by geographic areas: 1972 and 1971—Continued
(Thousand short tons)

Division and State	Gray and ductile nodular) iron castings		Malleable iron castings		Steel castings[3]		Production of raw steel[1]	
	1972	1971	1972	1971	1972	1971	1972	1971
Pacific	390	457	(D)	(D)	119	120	[r]8,156	[r]7,848
Washington } Oregon }	10	14	(D)	(D)	24	21	(D)	(D)
Oregon			—	—	34	32	(D)	(D)
California	380	443	—	—	61	67	3,652	3,595
Hawaii	—	—	—	—	—	—	(D)	(D)

Note: Since these estimates are based on a sample survey, they are subject to sampling variability. The relative standard errors for gray iron castings are listed in the appendix. The relative standard errors are 1 percent or less for all other estimates in this table. Data on production of raw steel represent essentially complete coverage.

-Represents zero.

(D) Withheld to avoid disclosing figures for individual companies. This detail figure is included, however, in the appropriate subtotals and totals in the table. In some cases figures which are otherwise publishable are withheld to avoid indirect disclosure by subtraction from higher-level totals or from related figures.

rRevised.

(Z) Less than 500 short tons.

[1] Source: American Iron and Steel Institute.

[2] Data for Arkansas are included with Mississippi, Alabama, and Tennessee.

[3] Data for the Mountain and Pacific Divisions are combined.

Source: Current Industrial Reports M33a(72)-13, U.S. Department of Interior, Bureau of Mines, April, 1974.

TABLE 12

Production of pig iron and consumption of iron and steel scrap and pig iron, by geographic areas: 1972 and 1971
(Thousand short tons)

Division and State	Pig iron production[1]		Consumption			
			1972		1971	
	1972	1971	Scrap	Pig iron	Scrap	Pig iron
United States, Total	88,940	80,918	93,371	89,140	82,567	81,178
New England	-------	-------	355	45	336	46
Maine and New Hampshire	-------	-------	12	5	29	6
Vermont	-------	-------				
Massachusetts	-------	-------	97	22	75	17
Rhode Island	-------	-------	133	4	120	5
Connecticut	-------	-------	113	14	112	18
Middle Atlantic	24,354	23,036	20,699	24,591	19,132	23,176
New York	3,998	4,196	2,452	3,660	2,490	3,789
New Jersey	-------	-------	651	58	623	
Pennsylvania	20,356	18,840	17,596	20,873	16,019	19,387
East North Central	45,819	39,933	46,449	45,981	39,832	39,855
Ohio	16,363	13,675	15,594	16,108	13,630	13,401
Indiana	15,330	12,696	10,728	15,118	8,763	12,776
Illinois	[2]14,126	[2]13,562	9,402	7,109	8,162	6,376
Michigan	([2])	([2])	9,819	7,527	8,507	7,185
Wisconsin	-------	-------	906	119	770	117
West North Central	([3])	([3])	2,446	86	2,487	413
Minnesota	([2])	([2])	2,446	86	620	394
Iowa	-------	-------			574	
North Dakota and South Dakota	-------	-------			-------	-------
Missouri	-------	-------			1,293	19
Nebraska	-------	-------				
Kansas	-------	-------				

See footnotes at end of table.

Production of pig iron and consumption of iron and steel scrap and pig iron, by geographic areas: 1972 and 1971—Continued
(Thousand short tons)

Division and State	Pig iron production[1]		Consumption			
			1972		1971	
	1972	1971	Scrap	Pig iron	Scrap	Pig iron
South Atlantic	6,967	7,164	6,919	7,151	6,242	7,363
Maryland	6,967	7,164	6,919	7,151	5,052	7,338
Delaware						
Virginia						
West Virginia						
North Carolina					1,190	25
South Carolina						
Georgia						
Florida						
East South Central	7,056	(3)	6,500	5,442	5,485	5,151
Kentucky	(4)	(4)	1,679	1,729	1,378	1.611
Mississippi	----------	----------			714	95
Tennessee	----------	----------	1,002	85		
Alabama	[4]7,056	[4]6,287	3,819	3,628	3,393	3,445
West South Central	(3)	(3)	4,094	1,154	3,367	641
Arkansas	----------	----------	4,094	1,154	350	5
Louisiana	----------	----------				
Oklahoma	----------	----------			3,017	636
Texas	(4)	(4)				
Mountain	4,744	4,498	[6]5,909	[6]4,690	2,217	[5]4,533
Arizona	----------	----------	[6]5,909	[6]4,690	2,217	[5]4,533
Colorado	[5]4,744	[5]4,498				
Utah	(3)	(3)				
Montana, Nevada	----------	----------				

See footnotes at end of table.

Production of pig iron and consumption of iron and steel scrap and pig iron, by geographic areas: 1972 and 1971—Continued
(Thousand short tons)

Division and State	Pig iron production[1]		Consumption			
			1972		1971	
	1972	1971	Scrap	Pig iron	Scrap	Pig iron
Pacific	([3])	([3])	([6])	([6])	3,469	([3])
Washington	-	-				-
Oregon	-	-	([6])	([6])	3,469	-
California	([5])	([5])				([5])
Hawaii	-	-				-

Note: Data are subject to sampling variability (see appendix). Detail may not add to totals due to independent rounding.

-Represents zero.

[1] Excludes silvery pig iron.

[2] Data for Illinois includes Michigan and Minnesota.

[3] Included in United States total.

[4] Data for Alabama includes Kentucky and Texas.

[5] Data for Colorado and Utah includes California.

[6] Data for Mountain Division includes Pacific Division.

Source: Current Industrial Reports M33a(72)-13, U.S. Department of Interior, Bureau of Mines, April, 1974.

The location of steel mills in the United States is shown in map 1. As noted, five States consume the vast bulk of scrap iron and steel and iron ores. These States have been shaded on the map. The economic necessity of positioning plants close to the source of supply of raw materials is exemplified by the geographic concentration of steelmaking facilities in the regions closest to the major areas of iron ore, coal and scrap production. For convenience, a State-by-State listing of the locations of steel mills is also included as table 13.

MAP 1

LOCATION OF STEEL MILLS IN THE UNITED STATES

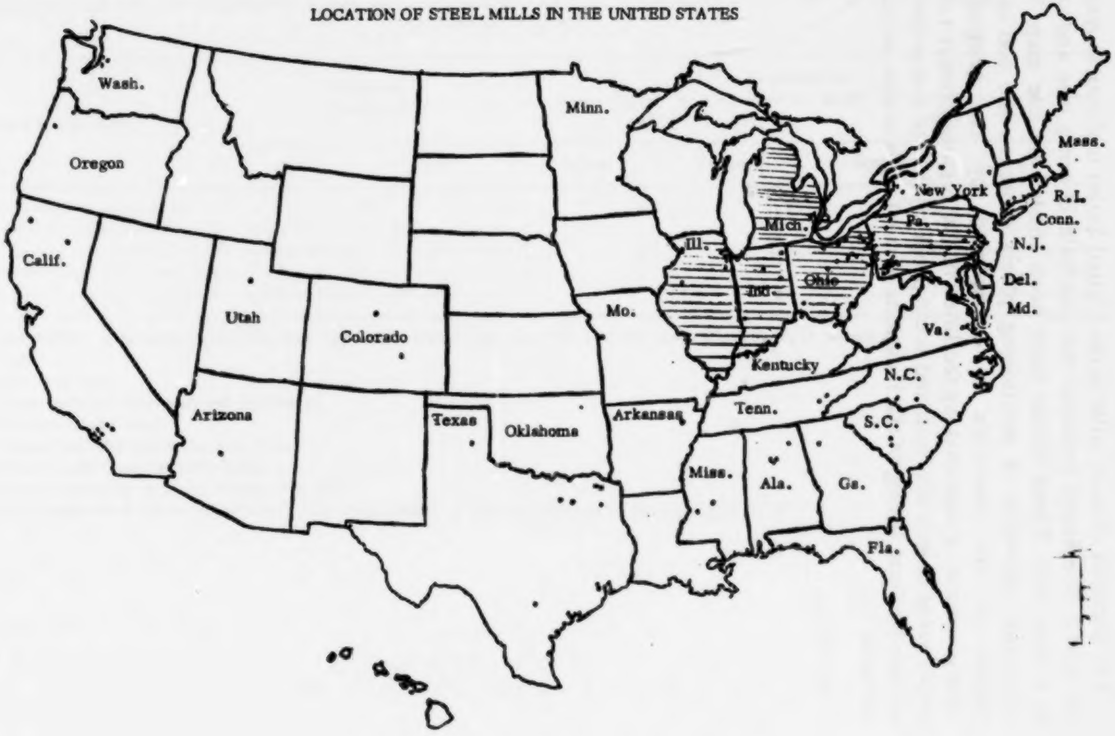

Wash.
Oregon
Calif.
Utah
Colorado
Arizona
Minn.
Texas
Oklahoma
Mo.
Arkansas
Ill.
Ind.
Mich.
Ohio
Kentucky
Tenn.
Miss.
Ala.
Ga.
Fla.
S.C.
N.C.
Va.
Pa.
New York
Mass.
R.I.
Conn.
N.J.
Del.
Md.

TABLE 13

Location of steel mills in the United States

Alabama
Birmingham
Fairfield
Gadsden

Arizona
Tempe

Arkansas
Newport

California
Emeryville
Etiwanda
Fontana
Long Beach
Los Angeles
Oakland
San Francisco
Torrance

Colorado
Denver
Pueblo

Connecituct
Bridgeport

Delaware
Claymont

Florida
Tampa

Georgia
Atlanta

Hawaii
Honolulu

Illinois
Alton
Chicago
Chicago Heights
Granite City
Kankakee
Lemont
Morton Grove
Peoria
South Chicago
Sterling

Indiana
Chesterton
East Chicago

Indiana—Continued
Fort Wayne
Gary
Kokomo
New Castle

Kentucky
Ashland
Newport
Owensboro

Maryland
Baltimore
Sparrows Point

Massachusetts
Boston

Michigan
Dearborn
Detroit
Ecorse
Ferndale
Trenton
Warren

Minnesota
Duluth
St. Paul

Mississippi
Flowood
Jackson

Missouri
Kansas City
St. Louis

New York
Buffalo
Dunkirk
Lackawanna
Lockport
New Hartford
North Tonawanda
Syracuse
Watervliet

New Jersey
Roebling

North Carolina
Croft
Monroe

Ohio
Campbell
Canton
Cincinnati
Cleveland
Lorain
Mansfield
Marion
Massillon
Middletown
Portsmouth
Steubenville
Warren
Youngstown

Oklahoma
Sand Springs

Oregon
McMinnville
Portland

Pennsylvania
Aliquippa
Beaver Falls
Bethlehem
Brackenridge
Braddock
Braeburn
Bridgeville
Burnham
Butler
Carnegie
Coatesville
Duquesne
Erie
Fairless Hills
Farrell
Harrisburg
Houston
Irvine
Ivy Rock
Johnstown
Latrobe
McKeesport
Midland
Milton
Monaca
Monessen
Munhall
New Castle
Oakmont
Philadephia
Phoenixville
Pittsburgh

Pennsylvania—Con.
Reading
Sharon
Steelton
Titisville
Washington
West Homestead

Rhode Island
Phillipsdale

South Carolina
Cayce
Columbia
Georgetown

Tennessee
Harriman
Knoxville

Texas
Daingerfield
Dallas
El Paso
Fort Worth
Houston
Lone Star
Longview
Pampa
Sequin
Vinton

Utah
Geneva

Virginia
Chesapeake
Gilmerton
Newport News
Roanoke

Washington
Seattle

West Virginia
Huntington
Weirton
Wheeling

Part I(B)(3): Iron and steelmaking operations

Background.—Steel may be produced either by reducing iron ore to iron and then refining the iron into steel or by the melting and refining of iron and steel scrap.

Iron, generally, is just an intermediate product of steelmaking. Most, but not all iron, is refined into steel. Some iron, however, is used by foundries to produce cast iron and cast steel.

Steel production generally of four stages:

(a) Preparation of raw materials.

(b) Reduction of iron ore to hot metal (or pig iron) in a blast furnace.

(c) Refining of the hot metal into raw steel (or the melting and refining of scrap into raw steel).

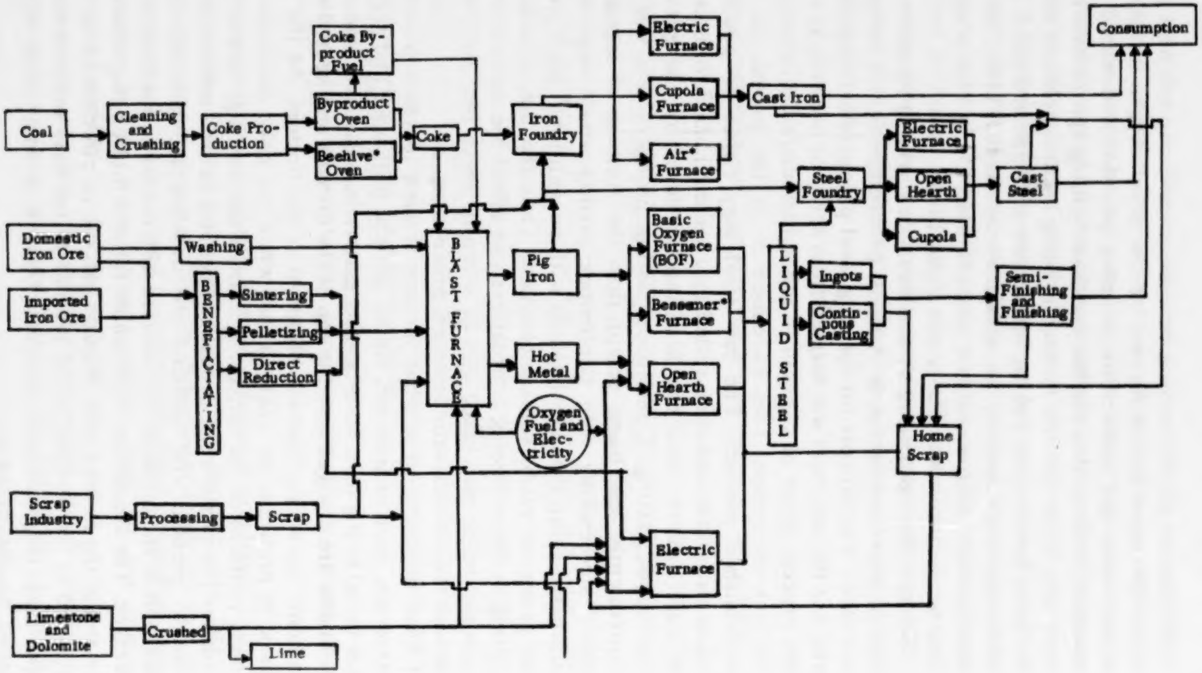
(d) Forming of steel products.

There are two major exceptions to the above process. When steel is produced in an electric furnace, scrap is the basic iron-bearing input and a blast furnace is not required. The other exception is cast iron production. The iron is not refined to steel in producing cast iron so stage (c) is bypassed.

Figure 11 presents a flow diagram of the iron and steel production process. The first stage is the preparation of the raw materials. Most raw materials do not undergo significant changes. The exceptions are the transformation of iron ore into pellets, sinter, or direct-reduced ore, the transformation of coal into coke, and the transformation of some limestone to lime. Also, scrap must undergo some processing to remove contaminants and improve its quality. The beneficiated ore and the direct-shipping ore are then reduced to iron in the blast furnace. The blast furnace outputs are hot metal and/or pig iron. The pig iron is produced primarily for use in foundries where it is made into cast iron or cast steel. Only a very small percent of the pig iron is used to make steel. The hot metal, on the other hand, is used almost exclusively in steel production.

FIGURE 11

FLOW DIAGRAM OF STEELMAKING PROCESS


Coal
Cleaning and Crushing
Coke Production
Byproduct Oven
Beehive* Oven
Coke By-product Fuel
Coke
Iron Foundry
Electric Furnace
Cupola Furnace
Air* Furnace
Cast Iron
Consumption
Domestic Iron Ore
Imported Iron Ore
Washing
BENEFICIATING
Sintering
Pelletizing
Direct Reduction
BLAST FURNACE
Pig Iron
Hot Metal
Oxygen Fuel and Electricity
Basic Oxygen Furnace (BOF)
Bessemer* Furnace
Open Hearth Furnace
Electric Furnace
LIQUID STEEL
Steel Foundry
Electric Furnace
Open Hearth
Cupola
Cast Steel
Ingots
Continuous Casting
Semi-Finishing and Finishing
Home Scrap
Scrap Industry
Processing
Scrap
Limestone and Dolomite
Crushed
Lime

The hot metal and varying proportions of scrap are next put into either the open hearth furnace or the basic oxygen furnace to be refined into raw steel. This refining process is directed toward removing carbon from the hot metal and adding appropriate alloying materials. If the electric furnace is being used to produce raw steel, the blast furnace and coking operations are bypassed since scrap is used almost exclusively to produce raw steel. (There are some instances in which some hot metal is used along with scrap in an electric furnace, but this is not typical.)

The raw steel produced by the three steelmaking furnaces is then formed into steel products. A small percentage is also formed into cast steel. The process for forming steel products is independent of whether the raw steel was formed from scrap or ore and, as a result, this process is not of concern in this subnumbered proceeding with but one exception. This exception is in the production of the semifinished product. The raw steel may either be poured into ingots to solidify and then rolled into a semifinished form or it may be cast directly into the semifinished form by the process of continuous casting. Continuous casting produces less waste (and consequently less home scrap) than the forming of ingots. As a result, steelmaking with continuous casting would require more purchased scrap than steelmaking with conventional ingot casting if the scrap/ore ratios remain constant. Thus the use of continuous casting or ingot casting alternatives can affect the amount of scrap required to be purchased and as a result, these two processes are considered in this subnumbered proceeding.

Blast furnaces.—The blast furnace is used to smelt iron-bearing materials, such as iron ore, sinter, pellets, mill scale and scrap into hot metal or pig iron. Iron-bearing materials, coke, and limestone or dolomite are charged into the top of the furnace and heated air and, in some instances, fuel are blown in at the bottom. As the hot air rises, it preheats the coke so that when the coke descends to the lower portions of the furnace it burns with very high intensity. The combustion of the coke produces heat and carbon monoxide which rise to preheat and reduced the iron-bearing materials as they descend in the furnace. The molten iron settles to the bottom of the furnace. The limestone or dolomite forms a molten slag which floats on top of the molten iron. Natural gas, oil, or powdered coal may be injected at the bottom of the furnace to increase temperatures and speed up the reduction process. Oxygen is sometimes added to speed up the process.

After the slag is drawn off, the hot metal is trapped and transferred to an open hearth or basic oxygen furnace (BOF) for refining. Some hot metal is formed into merchant pig iron which is sold to foundries or to steel mills which do not have blast furnaces or sufficient blast furnace capacity.

Table 14 presents the consumption of raw materials and other inputs and the production of scrap per net ton of hot metal produced in a blast furnace. The use of agglomerates, fuel oil, and oxygen has increased significantly since 1966. Iron ore, scrap mill cinder, scale, limestone, coke, and natural gas use has all decreased. The amount of scrap consumed per net ton of pig iron has remained relatively constant.[3]

TABLE 14

Raw material consumption and scrap production per net tons of pig iron produced

Raw material	Units	1972	1971	1970	1969	1968	1967	1966
Iron ore	Net tons	0.39	0.41	0.42	0.45	0.49	0.49	0.52
Agglomerates[1]	do	1.22	1.18	1.16	1.12	1.12	1.07	1.01
Scrap[2]	do	0.04	0.05	0.06	0.05	0.05	0.05	0.06
Mill cinder, scale, et cetera	do	0.05	0.06	0.06	0.06	0.06	0.06	0.06
Limestone and dolomite[3]	do	0.14	0.16	0.15	0.15	0.15	0.17	0.18
Coke[1]	do	0.61	0.63	0.63	0.63	0.62	0.63	0.64
Natural gas	Cubic feet	414	461	486	467	524	509	563
Fuel oil	Gallons	3.24	2.39	1.60	1.23	0.91	0.8	0.6
Oxygen	Cubic feet	174	164	148	96	75	100	99
Scrap produced	Net tons	0.015	0.013	0.022	0.011	0.012	0.015	0.014

[1] Based on total material charged less products recovered.

[2] Calculated from data in sources 22-27.

[3] Does not include flux contained in the agglomerates.

Source: American Iron & Steel Institute, Annual Statistical Report, 1971 and 1972, Washington, D.C., 1972.

Blast furnace technology will remain essentially unchanged over the near term. Output per individual blast furnace has been increasing in recent years but this is due primarily to the use of larger furnaces, to the increased use of beneficiated ore and to high temperatures in the blast furnace rather than to any major technological change.

The trends noted above in regard to increases and decreases in consumption of various raw materials are due primarily to pellets and other agglomerates replacing iron ore, sinter, coke, and limestone while oxygen enrichment and fuel oil injection are replacing natural gas use and decreasing the coke requirements.

---

[3] Alan Wood Steel Company states that scrap cannot be used in its blast furnaces.

Table 15 presents, for the near term, the typical blast furnace consumption of raw materials per net ton of hot metal produced. These consumption figures have been obtained by extrapolating current trends to 1975. The total amount of iron ore and agglomerates input to the blast furnace has remained relatively constant at around 1.6 net tons per ton of hot metal. By 1975 it is estimated that pellets will account for 51 percent of the ore and agglomerate input.

TABLE 15

Typical raw material consumption per ton of pig iron production in the near term

Raw material	Units	Amount
Iron ore[1]	Net tons	0.36
Agglomerates[1]	do	1.24
Scrap[1]	do	0.04
Mill cinder, scale, et cetera[1]	do	0.05
Limestone and dolomite[1]	do	0.14
Coke[1]	do	0.60
Natural gas[1]	Cubic feet	395
Fuel oil[1]	Gallons	6.40
Oxygen[1]	Cubic feet	185
Electricity[3]	KWHR	16
Coke oven gas[2]	10^6 BTU	0.05
Labor[2]	Manhours	0.39
Byproducts		
Scrap generated[1]	Net tons	0.015
Slag[1]	do	0.29
Blast furnace gas[2]	10^6 BTU	5735
Coke breeze[2]	10^6 BTU	0.29
Flue dust[1]	Net tons	0.04

[1] Based on Table 2-27, Final Environmental Impact Statement, p. 2-48.

[2] Source: Nelson, J.P., *An Interregional Recurcine Programming Model of the U.S. Iron and Steel Industry: 1947-1967*, Ph. D. Dissertation, The University of Wisconsin, Ann Arbor, 1970.

[3] Source: Leary, R.J., and G.M. Larwood, *Effects of Direct Reduction upon Mineral Supply Requirements for Iron and Steel Production*, U.S. Bureau of Mines, Washington, D.C., 1973.

In the long run, blast furnace technology will be affected primarily by the possible substitution of prereduced materials for iron ore and agglomerates. If the use of prereduced materials becomes widespread in blast furnace operations, there will be significant changes in the blast furnace technology. Otherwise, except for a continuation of some of the current trends, there will probably be very little change in blast furnace procedures. There currently are trends toward building superlarge blast furnaces, making higher basicity sinter and utilizing higher top pressure, higher blast temperatures, and injected fuels.

Two possible production functions are described below. The first illustrates the case of continuing with present technology and not introducing prereduced materials to the blast furnace. The second depicts the case of complete substitution of prereduced materials for iron ore and agglomerates.

By 1985 virtually all ore will be beneficiated before use in a blast furnace. Using agglomerates in the blast furnace will result in a lower requirement for coke, flux, and fuels. Table 16 gives the production function for a blast furnace using agglomerates and not using any iron ore. The use of oxygen, fuel oil, and natural gas has been held at 1975 levels due to current questions about the true value of these inputs. There is discussion about whether the increased use of these three inputs is economically worthwhile.

At present the use of prereduced pellets in a blast furnace is still in the experimental stage. Tests have indicated that a 100-percent prereduced pellet charge can increase blast furnace productivity by 75 percent and cuts coke usage by 50 percent compared to using a 100-percent agglomerate charge. The economic feasibility of the process is still in question, however. Two studies have shown that the use of prereduced pellets could be more profitable to the steel industry than the use of any other iron-bearing material. Further study is still required before a definite answer can be given on economic feasibility. Currently, there are no major efforts by the steel industry to commence testing of prereduced pellets on a plant scale.

Table 17 presents a production function for a blast furnace using a 100-percent prereduced pellet charge. Data are not available on energy consumption other than coke use, so it has been necessary to estimate the input of the other forms of energy. Since coke use is cut in half and productivity increases by 75 percent, it was decided to use 50 percent of the energy consumption required for a 100-percent agglomerate charge. Byproduct fuel production was also reduced accordingly.

TABLE 16

1985 raw material consumption per net ton of pig iron based upon current technology using only agglomerates[1]

Raw material	Units	Amount
Iron ore	Net tons	0
Agglomerates	do	1.60
Scrap	do	0.04
Mill cinder, scale, et cetera	do	0.05
Limestone and dolomite	do	0.11
Coke	do	[2]0.58
Natural gas	Cubic feet	[3]395
Fuel oil	Gallons	6.403
Electricity	KWHR	13
Coke oven gas	10^6 BTU	0.05
Oxygen	Cubic feet	[3]185
Labor	Manhours	0.34
Byproducts produced		
Scrap generated	Net tons	0.015
Blast furnace gas	10^6 BTU	5700
Coke breeze	10^6 BTU	0.29
Flue dust	Net tons	0.04
Slag	do	0.25

[1] Based on Table 2-44, Final Environmental Impact Statement, p. 2-73.

[2] Source: *National Petroleum Council, U.S. Energy Outlook—Coal Availability*, Washington, D.C., 1973.

[3] Kept at near term levels due to uncertainty of their economic value.

TABLE 17

1985 raw material consumption per net ton of pig iron based upon a charge of all prereduced ore

Raw material	Units	Amount
Prereduced pellets	Net tons	0.93
Scrap	do	0.03
Mill cinder, scale, et cetera	do	0.05
Limestone and dolomite	do	0.17
Coke	do	0.28
Natural gas	Cubic feet	200
Fuel oil	Gallons	3.20
Electricity	KWHR	7
Coke oven gas	10^6 BTU	0.03
Oxygen	Cubic feet	93
Labor	Manhours	0.34

1985 raw material consumption per net ton of pig iron based upon a charge of all prereduced ore—Continued

Raw material	Units	Amount
Byproducts		
Scrap generated	Net tons	0.015
Blast furnance gas	10^6 BTU	2850
Coke breeze	10^6 BTU	0.15
Flue dust	Net tons	0.04
Slag	do	0.20

Source: Leary, R.J., and G.M. Larwood, *Effects of Direct Reduction upon Mineral Supply Requirements for Iron and Steel Production*, U.S. Bureau of Mines, Washington, D. C., 1973.

Steelmaking.—The three furnaces most commonly used to produce steel are the BOF, the open hearth furnace, and the electric furnace. The first two are used predominantly to refine iron to steel. The electric furnace is used predominantly to transform scrap into steel.

As shown in table 19, the use of the BOF and the electric furnace has been steadily increasing while the use of the open hearth furnace has been steadily decreasing. In 1970 the BOF surpassed the open hearth as the leading producer of raw steel. For 1975 and 1985 it is estimated that the furnaces will produce the following percentages of raw steel:

TABLE 18

Estimate of raw steel production by type of furnace, 1985

	1975	1985
	Percent	*Percent*
BOF	52.9	63.5
Open hearth	25.8	7.0
Electric	21.3	29.5

TABLE 19

Raw Steel production by the various melting processes
(Thousands of net tons)

Year	Open hearth	Percent	BOF	Percent	Electric	Percent	Total
1973	39,780	26.4	83,260	55.2	27,759	18.4	150,799
1972	34,936	26.2	74,584	56.0	23,721	17.8	133,241
1971	35,559	29.5	63,943	53.1	20,941	17.4	120,443
1970	48,022	36.5	63,330	48.2	20,162	15.3	131,514
1969	60,894	43.1	60,236	42.6	20,132	14.3	141,262
1968	68,836	50.1	48,812	37.1	16,814	12.8	131,462

Source: American Iron & Steel Institute. *Annual Statistical Report, 1973.*

Raw steel production is estimated to be around 155 million net tons in 1975 and to be between 185 and 200 million net tons in 1985.

There are several new furnaces and processes which could affect steelmaking. However, substantial research and development are still necessary before any realistic evaluation can be made. Some examples of possible developments include: fuel-oxygen-scrap process, continuous counterflow steelmaking, torrax melting system, and direct steelmaking. These processes are not discussed because none of them is likely to be in use by 1985.

Basic oxygen furnaces.—Hot metal, scrap, lime, and oxygen are the basic inputs to the BOF. The scrap is first charged into the bottom of the furnace. Immediately following this, hot metal is then ladled into the furnace. An oxygen lance is then lowered into the furnace and oxygen is blown in at supersonic speeds. While oxygen is blown in, lime is added as a flux.

No external heat sources are used in the BOF. The heat contained in the hot metal and that generated in the oxidation process is used to melt the scrap. The hot metal is capable of melting approximately one-third its weight in scrap. In fact, scrap use is essential to this process as a means of absorbing the heat generated in the oxidation of the impurities in the hot metal. Scrap (primarily home scrap) normally makes up 25-31 percent of the metallic charge and hot metal the remainder.[4]

A BOF is capable of producing up to a 410-ton batch of raw steel in about 45 minutes, with a yield of around 85-90 percent. The yield is a measure of the raw steel produced as a percent of the total metallics charged into the furnace.

---

[4] Youngstown Sheet and Tube Company places this range at 26-32 percent and Armco Steel Corporation maintains that charges of 10-30 percent scrap are possible.

Table 20 shows the raw material consumption per net ton of raw steel produced in a BOF. Yields range from 86.2 percent in 1966 (1.16 net tons of metallics used to produce 1 net ton of raw steel) to 90.9 percent in 1969. The use of lime as a flux has slowly increased from 1966 to 1972 while the use of limestone has decreased. In fact, the consumption of lime, limestone, fluorspars, and oxygen appears to be relatively insensitive to the scrap and hot metal mix over the range of mixes in the table; 1970 and 1971 represent two extremes of the hot metal and scrap mix, yet the consumption of these four inputs remained almost constant. The decrease in limestone use in 1971 appears to be a continuing technological trend.

TABLE 20

Raw material consumption per net ton of raw steel produced in the BOF

Raw materials	Units	1972	1971	1970	1969	1968	1967	1966
Hot metal[1]	Net tons	(3)	0.81	0.78	0.77	0.80	0.81	0.82
Scrap[1]	do	(3)	0.31	0.33	0.33	0.33	0.34	0.34
Lime[2]	do	0.08	0.08	0.08	0.08	0.07	0.07	0.07
Limestone[2]	do	0.006	0.006	0.007	0.007	0.008	0.009	0.006
Fluorspar[2]	do	0.005	0.006	0.006	0.006	0.006	0.006	0.006
Oxygen[2]	Cubic feet	1851	1896	1900	1895	1779	1900	1853

[1] Calculated based on data in U.S. Bureau of Mines, *Minerals Yearbook 1966-71, Volume I Metals, Minerals, and Fuel.*

[2] Calculated based on data in American Iron & Steel Institute, *Annual Statistical Report*, 1971 and 1972.

[3] Not available.

The proportion of scrap and hot metal charged in the BOF is shown in table 21. In the period from 1965 to 1971, the proportion of scrap used has ranged between 28.7 and 30.1 percent.

TABLE 21

Proportion of scrap and hot metal used in the BOF

Year	Scrap	Hot metal
1973	28.7	71.3
1972	28.7	71.3
1971	28.9	71.1
1970	30.1	69.9

Proportion of scrap and hot metal used in the BOF—Continued

Year	Scrap	Hot metal
1969	29.9	70.1
1968	29.1	70.9
1967	29.3	70.7
1966	29.0	71.0
1965	29.6	70.4

Source: U.S. Bureau of Mines, *Minerals Yearbook 1966-71, Vol. I Metals, Minerals, and Fuel.*

In the near term the technology of the BOF is not expected to change. However, there is interest in increasing the amount of scrap that the BOF can handle. Preheating the scrap is the most likely means of permitting an increase in scrap usage to 33-37 percent of the charge, and a good amount of experiemental work has been carried out in this area; however, any increase in scrap usage in the near term due to preheating will be negligible as a result of increased costs and reduced productivity inherent in the process.

Table 22 presents three typical production functions for the BOF in the near term. For a selected scrap-to-hot-metal ratio, each production function gives the amount of raw materials input per net ton of raw steel produced. The scrap-to-hot-metal ratios have been selected to correspond to the high, middle, and low scrap to hot metal ratios which have occurred during the last decade. It is believed that in the near term, scrap usage will fall in this range. Each production function corresponds to a raw steel yield of 88 percent, which is the median yield of a BOF.

Scrap preheating and the Q-BOP (described below) are the two processes most likely to affect the BOF by 1985. Apart from two processes, no other significant changes are foreseen. BOF technology, both with and without scrap preheating, is discussed below. This is followed by a discussion of the Q-BOP.

TABLE 22

Typical raw material consumption per net ton of raw steel produced in the BOF in the near term

Raw material	Units	Scrap percentage		
		27.4	29.2	30.1
Hot metal[1]	Net tons	.82	.80	.79
Scrap[1]	do	.31	.33	.34
Lime[1]	do	0.08	0.08	0.08
Limestone[1]	do	0.006	0.006	0.006
Fluorspar[1]	do	0.006	0.006	0.006
Oxygen[1]	Cubic feet	1900	1900	1900
Labor[2]	Manhours	0.60	0.60	0.60
Byproducts				
Scrap generated[1]	Net tons	0.038	0.038	0.038
Slag	do	0.13	0.13	0.13

[1] Based on Table 2-28, Final Environmental Impact Statement, p. 2-50.

[2] Source: Barnes, T.M., and H. W. Lownie, Jr., *A Cost Analysis of Air Pollution Controls in the Integrated Iron and Steel Industry*, National Technical Information Center, Springfield, Va., 1969.

If scrap preheating and the Q-BOP do not come into widespread use, BOF technology in 1985 will be very much the same as today. Since its introduction in 1955 there has been very little change in the BOF. There has been a slight increase in oxygen input and scrap input and substitution of burnt lime for limestone, but other than this, the process is unchanged.

Table 23 details the production function for the BOF in 1985. Scrap use is assumed to be at 30 percent, the upper limit used today. Lime is expected to continue to be substituted for limestone. No other changes are envisioned.

TABLE 23

1985 production function for one net ton of raw steel production in BOF based upon current technology[1]

Raw material	Units	Amount
Hot metal	Net tons	0.79
Scrap	do	0.34
Lime	do	0.09
Limestone	do	0.005

1985 production function for one net ton of raw steel production in BOF based upon current technology[1]*—*Continued

Raw material	Units	Amount
Fluorspar	Net tons	0.005
Oxygen	Cubic feet	1900
Labor	Manhours	0.60
Byproducts		
Scrap generated	Net tons	0.038
Slag	do	0.13

[1] Based upon Tables 2-28 and 2-46, *Final Environmental Impact Statement*, pp. 2-50, 2-77.

Since the BOF does not use any external fuels in normal operation, the amount of scrap it can melt is determined by the heat generated in the oxidation of impurities in the hot metal. By preheating the scrap before it is charged into the BOF, more scrap can be melted. At present, methods of scrap preheating are still very much in the experimental stage. Experiments indicate that the use of up to 50 percent scrap may be feasible with preheating. However, more experience is necessary before firm conclusions can be drawn.

Table 24 shows a likely production function for a BOF process using scrap preheating to accept a 40-percent scrap charge. Preheating of the scrap requires additional oxygen and fuel use. The decreased hot metal charge reduces flux and oxygen requirements. Overall oxygen and fuel use increases and flux use decreases when compared to a BOF without preheating.

TABLE 24

Production function for one net ton of raw steel production in a BOF with scrap preheating

Raw material	Units	Amount
Hot metal	Net tons	0.68
Scrap	do	0.45
Lime	do	0.08
Limestone	do	0.005
Fluorspar	do	0.005
Oxygen	Cubic feet	2388
Labor	Manhours	0.60
Natural	Cubic feet	390

Production function for one net ton of raw steel production in a BOF with scrap preheating—Continued

Raw material	Units	Amount
Byproducts		
Scrap generated	Net tons	0.038
Slag	do	0.12

Source: Regan, W.J., R.W. James, and T.J. McLean, *Identification of Opportunities for Increased Recycling of Ferrous Solid Waste*, Institute of Scrap Iron and Steel, Inc., 1972, available from National Technical Information Center, Springfield, Va.

The Q-BOP process is identical to the BOF process except that oxygen is fed in at the bottom of the furnace rather than at the top. This increases the heat available and allows up to 20 percent more scrap to be melted. Scrap use can thus increase from around 30 percent to 36 percent of the metallic charge.

Table 25 presents a likely production function for the Q-BOP process. The derivation of this production function is based upon the fact that the consumption of both oxygen and flux is proportional to the hot metal use in the BOF and that only negligible amounts of oxygen and flux are required for scrap.

TABLE 25

Production function for one net ton of raw steel produced in A Q-BOP[1]

Raw material	Units	Amount
Hot metal	Net tons	0.72
Scrap	do	0.41
Lime	do	0.08
Limestone	do	0.005
Fluorspar	do	0.005
Oxygen	Cubic feet	1731
Labor	Manhours	0.60
Byproducts		
Scrap generated	Net tons	0.038
Slag	do	0.12

[1] Based upon Table 2-46, *Final Environmental Impact Statement*, p. 2-77, and Stone, J.K., "Increasing Scrap Usage by the L-D Process-Theory, Practice, and Prospect." *Iron and Steel Engineer* 40(6): 67-68, 1963.

Open-hearth furnaces.—Hot metal, scrap, limestone, oxygen, and heat are the basic inputs in open-hearth steelmaking. Scrap and limestone are first charged into the hearth and are heated by a flame produced by burning fuel oil, tar, or gas. When the scrap is at the proper temperature, hot metal is added. Normally, oxygen is injected by lances to speed up the melting of the scrap. Five to eight hours are required to produce a typical batch of 350 tons of steel, with a yield of around 87-91 percent.

Although the open hearth is the most versatile of the commercialized steelmaking processes and is capable of operating with an all scrap charge or an all hot metal charge, most are designed to use approximately equal proportions of both.[5] The most common charges range from 40-65 percent liquid blast furnace metal and 35-60 percent scrap.

The open-hearth furnace is slowly being phased out of steelmaking and is being replaced by the more efficient BOF.

Table 26 shows the raw material consumption per net ton of raw steel produced by the open-hearth furnace. Yields range from 84.8 percent in 1968 to 92.6 percent in 1971. This is slightly outside the expected range but the average yield for the 6-year period is 89.9 percent which falls almost in the center of the expected range. The use of lime, limestone, and fluorspar appears to be insensitive to the hot metal and scrap mix. Coke oven gas consumption has been decreasing while oxygen consumption has been increasing.

TABLE 26

Raw material consumption per net ton of raw steel produced in the open hearth

Raw materials	Units	1972	1971	1970	1969	1968	1967	1966
Hot metal[1]	Net tons	([3])	0.66	0.66	0.62	0.61	0.66	0.65
Scrap[1]	do	([3])	0.52	0.46	0.50	0.47	0.46	0.45
Lime[2]	do	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Limestone[2]	do	0.04	0.04	0.04	0.04	0.04	0.04	0.06
Fluorspar[2]	do	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Oxygen[2]	Cubic feet	1242	1085	1075	964	838	826	736
Coke oven gas[2]	do	324	368	459	492	498	463	647
Natural gas[2]	do	1380	1308	1204	1518	1552	1216	1129
Tar and pites[2]	Gallons	3.35	3.12	3.68	3.38	3.31	3.51	3.52
Fuel oil[2]	do	8.75	8.40	8.68	8.29	8.35	8.03	8.49

[1] Calculated from data in U.S. Bureau of Mines. *Minerals Yearbook 1966-71 Vol. I, Metals, Minerals, and Fuel.*

[2] Calculated from data in American Iron & Steel Institute. *Annual Statistical Report 1971 and 1972.*

[3] Not available.

---

[5] Armco Steel Corporation maintains that increasing the percentage of scrap input reduces productivity and Youngstown Sheet and Tube Company states that the mix used will depend in part on the availability of blast furnace metal and scrap and the prices of these commodities.

Table 27 gives the proportion of scrap and hot metal charged in the open hearth from 1965 to 1971. Scrap use has ranged between 41.1 percent in both 1966 and 1970 and 45.5 percent in 1972.

TABLE 27

Proportion of scrap and hot metal used in the open hearth

Year	Scrap	Hot metal
1973	44.5	55.5
1972	45.5	54.5
1971	43.6	56.4
1970	41.1	58.9
1969	44.7	55.3
1968	43.7	56.3
1967	41.2	58.9
1966	41.1	58.9
1965	41.2	58.8

Source: U.S. Bureau of Mines, *Minerals Yearbook 1966-71, Vol. I Metals, Minerals, and Fuel.*

In the near term open-hearth technology is not expected to change. There has been a definite trend toward increased oxygen and decreased coke oven gas use in the open hearth in recent years. Scrap and fuel oil has also increased slightly. The other inputs have remained relatively constant.

Table 28 presents three typical production functions for the open-hearth furnace in the near term. As with the BOF, each production function corresponds to the high, average, or low scrap to hot metal ratio used during the past decade. The production functions are based upon table 11. Each corresponds to a yield of 89 percent.

TABLE 28

Typical raw material consumption per net ton of raw steel production in the open hearth in the near term

Raw material	Units	Scrap percentage		
		44.6	42.9	41.1
Ore[1]	Net tons	0.02	0.02	0.02
Hot metal[2]	do	0.62	0.64	0.66
Scrap[2]	do	0.50	0.48	0.46
Lime[2]	do	0.01	0.01	0.01
Limestone[2]	do	0.04	0.04	0.04
Fluorspar[2]	do	0.002	0.002	0.002

Typical raw material consumption per net ton of raw steel production in the open hearth in the near term—Continued

Raw material	Units	Scrap percentage		
		44.6	42.9	41.1
Oxygen[2]	Cubic feet	1242	1242	1242
Coke oven gas[2]	do	324	324	324
Natural gas[2]	do	1380	1380	1380
Tar and Pitch[2]	Gallons	3.38	3.45	3.51
Fuel oil[2]	do	8.29	8.16	8.03
Labor[1]	Manhours	1.00	1.00	1.00
Byproducts				
Scrap generated[2]	Net tons	0.030	0.030	0.030
Slag generated[2]	do	0.12	0.12	0.12

[1] Source: Barnes, T. M., and H. W. Lownie, Jr., *A Cost Analysis of the Pollution Controls in the Integrated Iron and Steel Industry*, National Technical Information Center.

[2] Based on Table 2-30, *Final Environmental Impact Statement*, p. 2-53.

Due to the expected rapid decline in the use of the open-hearth furnace during the next decade, it is unlikely that there will be any significant changes in open-hearth technology in the long term. Of course, if there is any unforeseen technical improvement, it is possible that the decline of the open-hearth furnace might be halted.

One possible improvement in the open hearth is the submerged injection process. This process involves blowing oxygen into the side of the hearth instead of blowing it in through a roof lance. Melt time is reduced from 4 hours to 2 hours by this process. The likelihood of the submerged injection process being used in any significant amount cannot be estimated at this time. Unless its wide implementation drastically halts the open hearth's decline, it is unlikely to have much effect on steelmaking by 1985.

For the above reasons, the open hearth's production functions in 1985 are assumed to be the same as that given in table 28.

Electric furnaces.—Scrap, lime, and mill scale are the basic inputs to the electric furnace. There are two types of electric furnaces:

(a) The electric arc furnace, and (b) the electric induction furnace.

In the electric arc furnace the scrap is charged into the furnace and three carbon or graphite electrodes are lowered into the furnace and the electric power is turned on. Heat is produced by the current arcing from one electrode to the metallic charge and from the metallic charge to the next electrode, et cetera. When the scrap melts, lime is added to form a slag.

In the electric induction furnace, the electrodes are not used. Instead, a coil of copper tubing is wrapped around the furnace and an electric current is passed through the copper tubing. This generates a magnetic field which induces a current in the scrap charge. Heat is generated on the outside of the scrap due to the electrical resistance of the scrap charge. The heat is carried to the inside of the scrap by conduction.

Table 29 gives the raw material consumption per net ton of raw steel produced in all electric furnaces. There are some problems with these data. The data indicate that the yield of raw steel from the metallic inputs is over 100 percent. Obviously, this cannot be. Other sources normally state the metallic charge at around 1.068 net tons per net ton of raw steel; however, they do not describe how this figure is determined. For this subnumbered proceeding a metallic input charge of 1.068 net tons will be assumed as the best available evidence.[6]

TABLE 29

Raw material consumption per net ton of raw steel produced in electric furnaces

Raw materials	Units	1972	1971	1970	1969	1968	1967	1966
Pig iron[1] (or hot metal)	Net tons	(3)	0.03	0.01	0.01	0.02	0.02	0.01
Scrap[2]	do	(3)	0.96	0.93	0.97	0.97	0.99	1.02
Lime[2]	do	0.028	0.03	0.031	0.039	0.028	0.027	0.026
Limestone[2]	do	0.009	0.007	0.007	0.006	0.0065	0.008	0.008
Fluorspar[2]	do	0.003	0.003	0.0045	0.0035	0.004	0.0035	0.004
Oxygen[2]	Cubic feet	340	330	280	243	283	222	212

[1] Source: U.S. Bureau of Mines, *Minerals Yearbook 1966-71.*

[2] Source: American Iron & Steel Institute, *Annual Statistical Report, 1971 and 1972.*

[3] Not available.

Table 30 summarizes the proportion of scrap and pig iron (hot metal) in the electric furnace charge. Scrap accounts for 96.8 to 98.9 percent of the charge in a typical year.

---

[6] Sources: 12, 53, and 71.

TABLE 30

Proportion of scrap and pig iron used in the electric furnace

Year	Scrap	Pig iron
1973	96.9	3.1
1972	97.0	3.0
1971	97.9	2.1
1970	98.5	1.5
1969	98.9	1.1
1968	97.5	2.5
1967	98.1	1.9
1966	98.7	1.3
1965	97.8	2.2

Source: U.S. Bureau of Mines. *Minerals Yearbook, 1966-71.*

In the near term electric furnace technology will remain relatively unchanged. Experiments are being conducted on the feasibility of using prereduced pellets in the electric furnace and on the feasibility of preheating scrap before charging into the electric furnace. However, these two process changes are not likely to have any significant effect in the near term.

Table 31 presents three typical production functions for the electric furnace in the near term. Each production function corresponds to the high, middle, or low scrap to hot metal ratio used during the past decade. Since the data in table 29 appear suspect, these production functions are taken from the literature without modification. They correspond to a yield of 93.5 percent.

TABLE 31

Typical raw material consumption per net ton of raw steel production in an electric arc furnace in the near term

Raw material	Units	Scrap percentage		
		97.2	98.1	99.1
Pig iron (or hot metal)[1]	Net tons	0.03	0.02	0.01
Scrap[1]	do	1.04	1.05	1.06
Lime[2]	do	0.03	0.03	0.03
Limestone[2]	do	0.007	0.007	0.007
Fluorspar[2]	do	0.003	0.003	0.003
Oxygen[1]	Cubic feet	340	340	340
Electricity[1]	KWHR	520	520	520
Electrode[1]	Net tons	0.006	0.006	0.006
Labor	Manhours	0.78	0.78	0.78

Typical raw material consumption per net ton of raw steel production in an electric arc furnace in the near term—Continued

Raw material	Units	Scrap percentage		
		97.2	98.1	99.1
Byproducts				
Scrap generated[1]	Net tons	0.03	0.03	0.03
Slag generated[1]	do	0.07	0.07	0.07

[1] Source: 17.

[2] Source: 12.

[3] Source: 12, revised, using data in 2.

In the long run, electric furnace technology will be affected by four major technological considerations:

(a) Prereduced materials.
(b) Continuous charging.
(c) Scrap preheating.
(d) Hot metal usage.

At present, it is not possible to predict what portion if any, of future electric furnace technology will consist of the above processes. This subsection discusses the likelihood of each process being in use by 1985 and, when possible, describes the production function associated with the process. In addition, a production function is given for a typical process, assuming that none of these technological changes comes about.

The final environmental impact statement theorized that electric furnace usage is expected to increase from 15.4 percent in 1970 to 29.5 percent in 1985. It is probable that the new furnaces built during this period will be constructed according to the best technology available. If there is no change in electric furnace technology, these new furnaces will most likely be built to use the best technology available today.

Table 32 presents the production function for the best contemporary electric furnace practice in 1970. This best practice has been determined by the Bureau of Mines, U.S. Department of Interior.

TABLE 32

Best contemporary electric furnace practice, 1970

Raw material	Units	Amount
Pig iron	Net tons	0.02
Scrap	do	1.05
Lime	do	0.03
Limestone	do	0.007
Fluorspar	do	0.005
Oxygen	Cubic feet	0
Electricity	KWHR	450
Electrode	Net tons	0.006
Labor	Manhours	0.78
Byproducts		
Scrap generated	Net tons	0.03
Slag	do	0.07

Source: 12.

Table 33 presents the typical production function for electric furnace steelmaking in 1985, assuming no technological change. The production function in table 33 has been derived from the production functions in tables 33 and 32 in the following manner. It is assumed that all new furnaces will have production functions similar to table 32. The 1985 production function is then calculated as a weighted average of the current average technology and this best contemporary technology.

TABLE 33

Raw material consumption per net ton of raw steel produced in the electric furnace in 1985

Raw material	Units	Amount
Pig iron	Net tons	0.02
Scrap	do	1.05
Lime	do	0.03
Limestone	do	0.007
Fluorspar	do	0.004
Oxygen	Cubic feet	177
Electricity	KWHR	486
Electrode	Net tons	0.006
Labor	Manhours	0.78

Raw material consumption per net ton of raw steel produced in the electric furnace in 1985—Continued

Raw material	Units	Amount
Byproducts		
Scrap generated	Net tons	0.03
Slag	do	0.07

Sources: Table 16 and Source 12.

Prereduced materials can be used in place of scrap in electric furnaces. Studies have shown that the use of a charge containing 30-50 percent prereduced materials is the most feasible in terms of reducing power consumption and heat time for the electric furnace. It has also been shown that if prereduced materials are charged in the normal batch practice, operational difficulties occur which can result in higher power consumption and longer heat times.

This has led to studies on the effect of continuous charging of prereduced materials in the electric furnace instead of batch input. These studies have shown that the use of prereduced materials in conjunction with continuous charging decreases heat times and power consumption and increases productivity. Technically the practice appears to be feasible but the economic questions have not all been answered.

The technological advantages of using direct-reduced materials in electric steelmaking are evolving. One of the deterrents is that large amounts of direct-reduced materials are not currently available, due to an inadequate supply of natural gas. Also, the results reported to date have not shown a clear superiority over conventional practices using scrap. For these reasons, and because of the uncertainty about future prices for reduced pellets and scrap, acceptance has been slow. Present direct-reduction capacity in the United States is less than 1 million tons per year of direct-reduced iron ore. Consequently, it is not possible to predict either the percent of electric furnaces that will use prereduced materials in the future or the exact prereduced charge that will be used. Table 34 presents production functions for three electric furnace processes using 30 percent, 40 percent and 50 percent prereduced charges, respectively.

TABLE 34

Raw material consumption per net ton of raw steel production in an electric furnace using various levels of prereduced materials

Raw materials	Units	Percent prereduced charge		
		30	40	50
Prereduced ore	Net tons	0.33	0.46	0.56
Scrap	do	0.77	0.64	0.56
Lime	do	0.06	0.05	0.06
Limestone	do	0.01	0.01	0.01
Fluorspar	do	0.003	0.002	0.002
Oxygen	Cubic feet	340	340	340
Electricity	KWHR	496	488	480
Electrode	Net tons	0.004	0.004	0.004
Labor	Manhours	0.64	0.64	0.64
Coke breeze	Net tons	0.006	0.007	0.008
Byproducts				
Scrap generated	Net tons	0.03	0.03	0.03
Slag	do	0.14	0.14	0.14

(1)Source: 11
(2)Source: 12

The idea of using preheated scrap in an electric furnace has been under study for a number of years. Many different methods have been investigated. Calculations presented have shown that preheating scrap before use in electric furnace can result in lower operating cost per ton of steel produced and higher productivity. However, such calculations must be considered preliminary. More study is required to see if scrap preheating is economically feasible as well as technically feasible. Consequently, it is not possible to predict whether scrap preheating will be an integral part of the electric furnace technology in the future or to describe a production function for this process.

The feasibility of using hot metal in an electric arc furnace has been investigated with varying degrees of success. It appears that hot metal will have only a limited application in the electric furnace. Hot metal most likely will be used only in those instances when new steel capacity is not sufficient to justify construction of a new BOF. In such cases, an electric arc furnace may be built to use the available hot metal. The production function described in the paragraph on best present technology includes a limited pig iron (hot metal) usage.

Continuous casting.—The raw steel produced in any of the three steelmaking furnaces is formed into semifinished products called slabs, blooms, and billets. These semifinished products are then formed into finished products such as rails, wire, steel sheets, et cetera.

The semifinishing and finishing processes produce recoverable scrap losses and unrecoverable losses. Table 20 shows total raw steel production, net shipments of finished products and the yield of finished products from raw steel. Shipment data reported by The American Iron and Steel Institue (AISI) for the years 1970-1972 include estimates of shipments by nonreporting companies. Shipment data reported by AISI for prior years do not include such estimates. In 1970-1972 nonreported shipments averaged 1.59 percent of reported shipments. That data in table 35 for the years 1963-1969 have been modified from AISI data by multiplying the AISI data by 101.59 percent to account for unreported shipments. For the 10-year period, average product yield from raw steel was 69.3 percent.

TABLE 35

Product yield

Year	Raw steel production (thousand net tons)	Net shipments (thousand net tons)	Yield (percent)
1972	133,241	91,805	68.9
1971	120,443	87,038	72.3
1970	131,514	90,798	69.0
1969	141,262	[1]95,370	67.5
1968	131,462	[1]93,317	71.0
1967	127,213	[1]85,231	67.0
1966	134,101	[1]91,426	68.2
1965	131,462	[1]94,139	71.6
1964	127,076	[1]86,296	67.9
1963	109,261	[1]76,756	70.3

[1] Modified from AISI data to account for nonreported shipments.

Source: 3

In 1970, there were an estimated 17 million net tons of continuous casting capacity. There are no statistics available on actual production, but it is believed that production was substantially below capacity. By 1985 it is estimated that there will be 40 million net tons of continuous casting capability, accounting for over 15 percent of raw steel production.

Based on the final environmental impact statement assumption that half of the 17 million net tons of capacity were used in 1970, continuous casting handled approximately 6.4 percent of raw steel production. Assuming a linear growth to 15 percent by 1985, it is estimated that continuous casting may account for 9.3 percent of production in 1975.

Since conventional casting has an average product yield of around 69 percent and continuous casting has an average product yield of around 85 percent, it is estimated that in 1975 the average product yield from raw steel will be 70.5 percent. It is further estimated that the average product yield will be 71.4 percent in 1985.

Foundries.—In the near term, the technology of the foundry industry is not expected to change significantly from the present technology. Electric furnace use may grow slightly and cupola and open hearth use may decrease slightly.

Foundry shipments are estimated to be 20 million net tons in 1975 and 27 million net tons in 1985. For the last 5 years steel castings have averaged 9.7 percent of the total castings shipments and iron castings have averaged 90.3 percent. Based on these averages, in 1975 steel foundries are estimated to ship 1.94 million tons and iron foundries are estimated to ship 18.06 million tons. In 1985 iron foundries will ship 24.4 million net tons, and steel foundries will ship 2.6 million net tons.

Steel foundries.—The electric furnace is the furnace most widely used in the steel foundry industry accounting for over 70 percent of all steel casting tonnage. The open-hearth furnace is the next most widely used. The cupola furnace produces most of the remainder of the steel castings.

During operation, the cupola furnace first has a bed of sand rammed in to seal the bottom. Coke is placed on the rammed sand bottom and ignited by gas torch or electric starter. Layered charges of scrap, pig iron, coke, and limestone are then added. An airblast is then turned on and melting begins.

Table 36 shows the proportion of scrap and pig iron charges into each steel foundry furnace. The electric furnace uses around 98.5 percent scrap. The cupola furnace uses between 94.5 and 99 percent scrap. The open-hearth furnace has slowly been increasing scrap usage and currently charges over 92 percent scrap.

TABLE 36

Percentage of scrap and pig iron input in steel foundry furnaces

Furnace	Input	Percent						
		1971	1970	1969	1968	1967	1966	1965
Electric	Scrap	98.7	98.5	98.3	98.3	98.4	98.5	98.5
Do	Pig iron	1.3	1.5	1.7	1.7	1.6	1.5	1.5
Cupola	Scrap	95.5	94.5	98.4	98.8	96.8	95.7	95.5
Do	Pig iron	4.5	5.5	1.6	1.2	3.2	4.3	4.5
Open hearth	Scrap	92.2	91.5	90.1	87.1	88.1	88.3	89.7
Do	Pig iron	7.8	8.5	9.9	12.9	11.9	11.7	10.3

Sources: 22-27.

The consumption of selected raw materials in all steel foundry furnaces per net ton of steel castings shipment is presented in table 37. Based on these data, the yield per ton of shipment has ranged between 51.0 and 55.6 percent since 1966. Separate figures are not available on fluorspar consumption for iron foundries and for steel foundries. In table 37 it has been assumed that steel foundries consume most of the fluorspar. (Since steel foundries have produced a relatively constant proportion of all foundry shipments in recent years, any apportionment of fluorspar between iron and steel foundries will not have any effect on a calculation of the total fluorspar consumed by foundries.

TABLE 37

Consumption of selected raw materials per net ton of steel castings shipments

Raw material	Units	1971	1970	1969	1968	1967	1966
Pig iron	Net tons	0.04	0.06	0.06	0.08	0.09	0.09
Scrap	do	1.76	1.80	1.76	1.73	1.87	1.79
Fluorspar[1]	do	0.02	0.01	0.01	0.02	0.01	0.01

[1] Assumes steel foundries use virtually all fluorspar used in iron and steel foundries.
Sources: 22-27.

Table 38 shows the scrap generated in the production of steel castings as a percentage of the amount of castings shipped. The amount of scrap produced per ton of shipment has been declining rapidly. The percent of scrap generated per ton of shipment has declined from 90 percent in 1963 to 54.8 percent in 1971.

TABLE 38

Scrap generated in producing steel castings

Year	Scrap generated (thousand net tons)	Scrap generated as percent of shipment (percent)
1971	870	54.8
1970	1032	59.9
1969	1216	64.0
1968	1166	67.3
1967	1468	79.0
1966	1613	74.8
1965	1585	80.8
1964	1496	81.5
1963	1353	90.0

Sources: 22-27.

In the near term steel foundry technology will remain essentially unchanged. The only change will be in the proportion of castings produced by each type of furnace.

Table 39 presents the estimated percentage of steel castings produced by each type of furnace. These percentages have been calculated based upon the metallic input to each furnace in each year.

TABLE 39

Estimate of percentage of steel castings produced, by furnace[1]

Year	Electric	Cupola	Open hearth
1971	79.1	10.9	10.0
1970	76.6	10.3	13.1
1969	74.1	11.0	14.9
1968	65.6	15.9	18.5
1967	68.2	12.4	19.4
1966	68.6	10.4	21.0
1965	67.8	9.6	22.6

[1] Calculated based upon pig iron and scap inputs reported in Sources 22-27.

Table 40 presents a typical production function for a steel foundry furnace. This production function has been developed from the production function of an electric arc furnace, a cupola furnace, and an open-hearth furnace using a high cold-metal charge by weighing each production function by its percent of use in 1971 as given in table 39.

TABLE 40

Typical raw material consumption per net ton of steel castings shipment in the near term[1]

Raw material	Units	Amount
Pig iron[2]	Net tons	0.06
Scrap[2]	do	1.76
Lime	do	0.03
Limestone	do	0.01
Fluorspar[3]	do	0.01
Oxygen	Cubic feet	417
Electricity	KWHR	639
Electrode	Net tons	0.008
Natural gas	Pounds	4.14
Labor	Manhours	1.32
Byproducts		
Scrap generated[3]	Net tons	0.548
Slag generated	do	0.10

[1] Based on the following sources: (1) Table 16, (2) Sources: 9 and 10, and (3) Source 20.
[2] Based on Table 22.
[3] Based on Table 23.

No major change in steel foundry technology is foreseen by 1985. The most likely change is a continuation of the increase in electric furnace usage and the virtual elimination of the open-hearth furnace. Estimates of changes in production functions or of furnace mix could not be obtained, so the production function in table 40 is assumed to apply in the long term.

Iron foundries.—The cupola furnace is most widely used by the iron foundry industry. The electric furnace accounts for most of the remainder of production. The air furnace has been used in the past but has been almost completely phased out at present.

The proportion of scrap and pig iron charged in each iron foundry furnace is summarized in table 41. Scrap usage in the cupola furnace has steadily increased and currently is over 88 percent of the charge. The electric furnace currently employs a scrap charge of around 94 percent. Other iron foundry furnaces currently use an 86-percent scrap charge.

TABLE 41

Percentage of scrap and pig iron input in iron foundry furnaces

Furnace	Input	Percentage						
		1971	1970	1969	1968	1967	1966	1965
Cupola	Scrap	88.2	85.0	82.3	82.7	80.9	80.1	78.9
Do	Pig iron	11.8	15.0	17.7	17.3	19.1	19.9	21.1
Electric	Scrap	94.2	93.4	95.8	94.7	92.7	87.5	87.9
Do	Pig iron	5.8	6.6	4.2	5.3	7.3	12.5	12.1
Other	Scrap	86.1	80.6	79.4	79.6	90.5	91.8	91.8
Do	Pig iron	13.9	19.4	20.6	20.4	9.5	8.2	8.2

Sources: 22-27.

Table 42 lists the consumption of selected raw materials per net ton of iron foundry shipments. Based on this data, the yield per ton of shipments has ranged between 83.3 and 96.2 percent since 1966. Separate figures are not available on coke consumption for iron foundries and for steel foundries. In table 42 it is assumed that iron foundries use virtually all of the coke. For the reason previously given, a calculation of the coke consumption by foundries is independent of the exact apportionment.

TABLE 42

Consumption of selected raw materials per net ton of iron castings shipments

Raw material	Units	1971	1970	1969	1968	1967	1966
Pig iron	Net tons	0.13	0.15	0.17	0.17	0.24	0.26
Scrap	do	1.03	0.89	0.87	0.87	0.96	0.94
Coke[1]	do	0.21	0.21	0.19	0.20	0.20	0.19

[1] Assumes iron foundries consume virtually all the coke used in iron and steel foundries. Data from Source 12.

Sources: 22-27.

The scrap generated per ton of shipments is given in table 43. The amount of scrap generated per ton of shipment has decreased slightly in recent years. From 1963 to 1967, scrap generation exceeded 40 percent of the amount shipped. From 1968 to 1971, this figure has dropped to around 35.5 percent.

TABLE 43

Scrap generated in producing iron castings

Year	Scrap generated (Thousands net tons)	Scrap generated as a percent of shipments (Percent)
1971	5,691	37.0
1970	5,149	34.8
1969	5,814	34.0
1968	5,740	35.6
1967	6,532	42.5
1966	6,930	41.1
1965	6,650	39.5
1964	5,992	39.1
1963	5,664	41.4

Sources: 22-27.

In the near term iron foundry technology is expected to remain essentially unchanged. The only change may be in the proportion of castings produced by each type of furnace.

Table 44 presents the estimated percentage of iron castings produced by each type of furnace. These percentages have been calculated based upon the metallic input to each furnace in each year.

TABLE 44

Estimate of percentage of iron castings produced by furnace[1]

Year	Cupola	Electric	Other
1971	85.0	12.8	2.2
1970	84.6	12.6	2.8
1969	87.2	10.4	2.4
1968	89.9	7.8	2.3
1967	89.4	4.3	6.3
1966	90.5	1.9	7.6
1965	90.7	1.6	7.7

[1] Calculated based upon pig iron and scrap inputs reported in Sources 22-27.

A typical production function is given in table 45. This production function has been developed from the functions of electric arc furnaces, electric induction furnaces, and cupola furnaces, weighing each production function by its percent of use as given in table 44.

TABLE 45

Typical raw material consumption per net ton of iron castings shipment in the near term[1]

Raw material	Units	Amount
Pig iron[2]	Net tons	0.13
Scrap[2]	do	1.03
Coke[3]	do	0.20
Limestone	do	0.04
Natural gas	Pounds	27
Electricity	10^6 BTU	359
Labor	Manhours	1.32
Byproducts		
Scrap generated[2]	Net tons	0.355
Slag generated	do	0.02

[1] Sources: 9 and 10.

[2] Based on Table 27.

[3] Based on the latest four-year average of the data in Table 28.

No major changes in foundry technology are foreseen by 1985. The most likely change is a continued increase in electric furnace use and a decrease in cupola use. By 1980, it is estimated that electric furnaces will account for not more than 15 percent of iron foundry production.

Estimates of changes in the production function from the near term could not be obtained during the study period, so the production functions in table 45 are assumed to apply for the long term.

Part I(B)(4): Environmental considerations in manufacture.

The major process for producing iron in the United States is the blast furnace. The functions of each of the materials charged are:

a. Iron ore (in the form of pellets, sinter, concentrated ore or direct shipping ore)—used as the primary source of iron.

b. Coke—provides carbon for the reducing gas and heat.

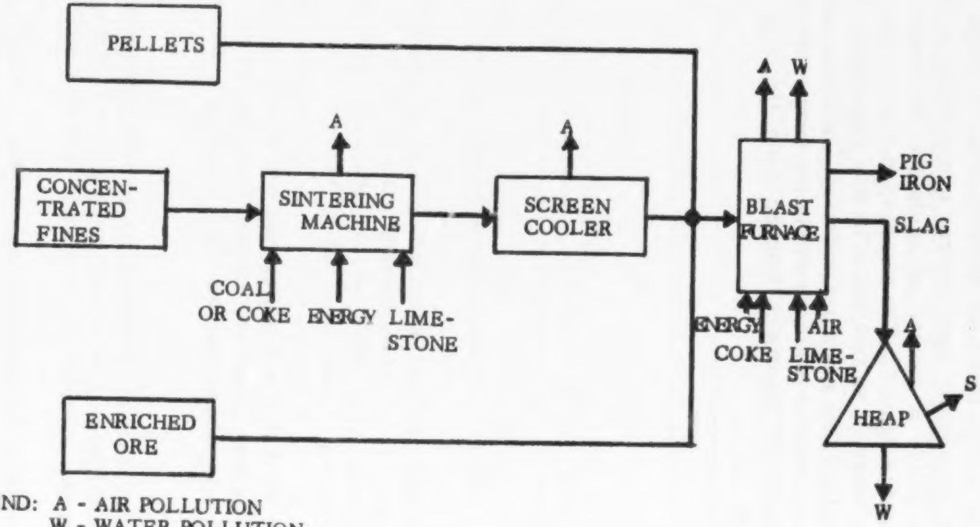
c. Limestone—flux to make impurities fusible and to remove impurities from the molten iron.

d. Oxygen—added to speed up the reduction process.

The two major materials produced by the blast furnace are individual molten streams of pure iron and slag. The latter is the mixture of molten limestone and impurities. As might be expected, the high-temperature environment under which a blast furnace operates yields a variety of pollutant discharges. These are enumerated in figure 12. The slag heap may be termed a solid waste problem. However, in addition to its own undesirable presence, it is a source of both air and water pollution. The former emissions arise from slow chemical reactions within the heap, while the latter are more typical of impurities leached from the slag heap during rainstorms.

FIGURE 12

BLAST FURNACE OPERATION


PELLETS
CONCEN-TRATED FINES
ENRICHED ORE
SINTERING MACHINE
A
COAL OR COKE
ENERGY
LIME-STONE
SCREEN COOLER
A
BLAST FURNACE
A
W
PIG IRON
SLAG
ENERGY
COKE
LIME-STONE
AIR
HEAP
A
S
W

LEGEND: A - AIR POLLUTION
W - WATER POLLUTION
S - SOLID WASTE OR LAND UTILIZATION

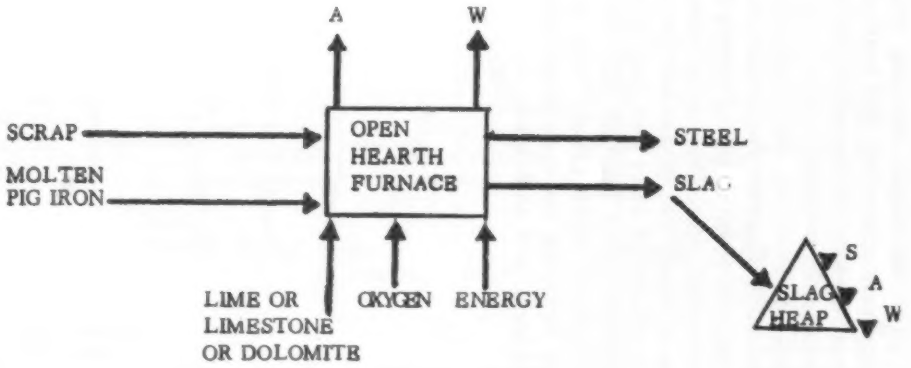
SOURCE: AMERICAN IRON AND STEEL INSTITUTE, 1972 STEELMAKING FLOW CHARTS

For the most part, discharges resulting from blast furnace operations are rigorously controlled. For both the near and long terms the only improvements envisioned would be more effective control and housekeeping practices.

The production of steel by the open-hearth process is schematically depicted in figure 13. The process basically consists of charging molten pig iron, scrap steel and fluxing agent into a large, but shallow, "pool-shaped" area. The mix is heated by exposing the surface to a sweep of flames. The flames melt the charge and over a period of time a mixture of steel and slag is formed. Recently, utilization of an oxygen lance inserted into the flame has raised temperatures and reduced melting time. Thus, production rates of steel are increased. Typically, the open-hearth process will produce about 350 tons of steel in 5 to 8 hours.

FIGURE 13

OPEN HEARTH PRODUCTION OF STEEL


A
W
SCRAP
MOLTEN PIG IRON
OPEN HEARTH FURNACE
STEEL
SLAG
LIME OR LIMESTONE OR DOLOMITE
OXYGEN
ENERGY
SLAG HEAP
S
A
W

LEGEND: A - AIR POLLUTION
W - WATER POLLUTION
S - SOLID WASTE OR LAND UTILIZATION

SOURCE: AMERICAN IRON AND STEEL INSTITUTE, 1972
STEELMAKING FLOW CHARTS

The major form of pollution in the open-hearth furnace is particulates emitted into the air. The blasts of the oxygen lance create considerable agitation in both the flame and melt areas. This in turn increases the particulate discharges from these furnaces.

The pollutant discharges and energy demands are somewhat dependent upon the proportion of scrap iron to molten pig iron charges. While no exact figures were revealed for relative changes, with changing proportions the following will most likely occur if the scrap charge is increased:

a. Particulates (no oxygen lance)—slight increase dependent upon fuel characteristics for flame.
b. Particulates (oxygen lance)—increase.
c. Sulfur—increase dependent upon fuel characteristics.
d. Slag—decrease, dependent upon scrap impurities.
e. Energy from fuel—increase.
f. Energy from flux—decrease.
g. Energy from oxygen—increase.

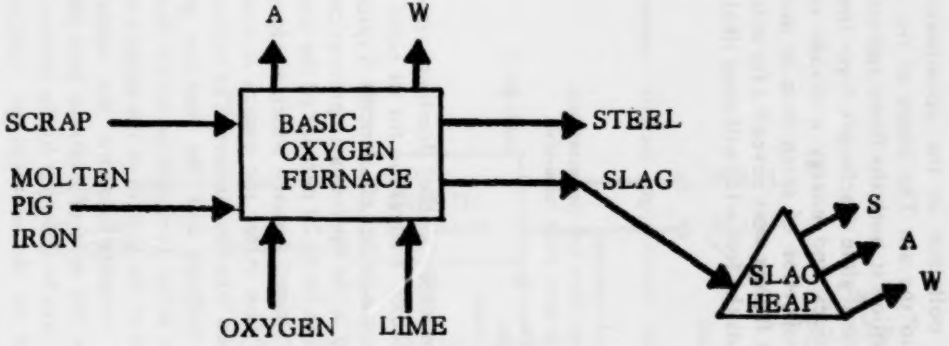
The basic oxygen process is the dominant mode of steel production in America today. The reason for its rapid replacement of the open-hearth process is higher efficiencies. Typically the same amount of steel produced in the open-hearth process can be made in the basic oxygen process in 10 to 20 percent of the time. The heart of the process is a pear-shaped furnace which is charged with hot metal, scrap metal, and flux. After the charge is complete, high-pressure oxygen is released into the mixture. The carbon and silicon in the hot metal are oxidized and the reaction generates the required heat to melt the scrap. It should be noted that no external heat sources are supplied to the system as the molten iron provides the initial combustion temperatures for the initiation of the oxidation reactions. It is this lack of external heat that limits the percentage of scrap that may be charged to the system. Since scrap is normally at or close to the ambient air temperature upon charging, excessive amounts would quench the molten pig iron charged and not permit the start of the oxidation process.

A schematic representation of the basic oxygen process is given in figure 14 showing the sources of pollution and points of energy inputs.

best copy available

FIGURE 14

STEEL PRODUCTION BY THE BASIC OXYGEN PROCESS


A
W
SCRAP
MOLTEN PIG IRON
BASIC OXYGEN FURNACE
STEEL
SLAG
OXYGEN
LIME
SLAG HEAP
S
A
W

LEGEND: A - AIR POLLUTION
W - WATER POLLUTION
S - SOLID WASTE OR LAND UTILIZATION

SOURCE: AMERICAN IRON AND STEEL INSTITUTE, 1972
STEELMAKING FLOW CHARTS

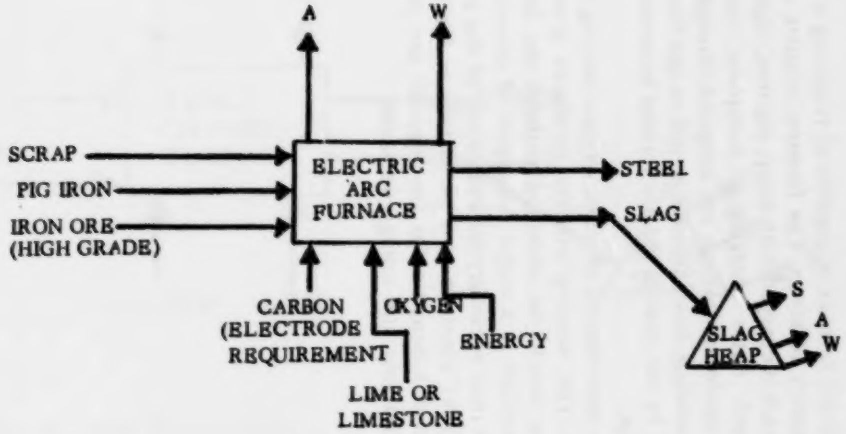
The electric arc furnace is capable of receiving a metallic charge composed entirely of scrap. The furnace consists of a cup-shaped receptacle which is charged with scrap, pig iron, high grade iron ore, and flux (lime). After charging is complete, large amounts of electricity at moderate voltage are supplied through large graphite electrodes extending down through a roof on the furnace. Melting is accomplished by the heat of the arc formed between the electrodes and the charge.

As with the open-hearth process, oxygen lancing may or may not be practiced. The lancing process produces greater particulate emissions than would be obtained without the lance. Since the electric arc process is a major consumer of electrical energy, the total pollution load necessary for evaluation of this process includes that at the power plantsite as well as that at the furnace site.

Figure 15 is a schematic for the electric arc process showing sources of pollutants and energy demands.

FIGURE 15

ELECTRIC ARC PROCESS FOR PRODUCTION OF STEEL


A
W
SCRAP
PIG IRON
IRON ORE
(HIGH GRADE)
ELECTRIC
ARC
FURNACE
STEEL
SLAG
CARBON
(ELECTRODE
REQUIREMENT
OXYGEN
ENERGY
LIME OR
LIMESTONE
SLAG
HEAP
S
A
W

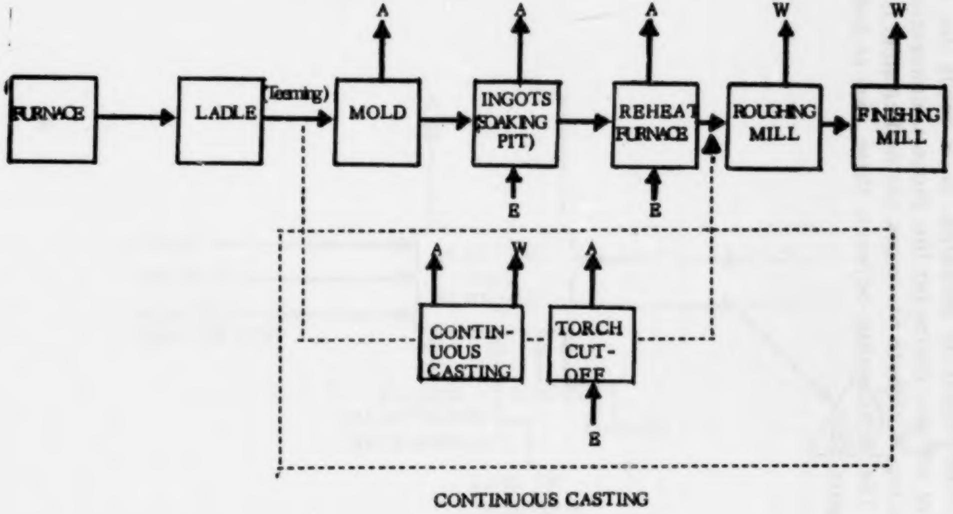
LEGEND: A - AIR POLLUTION
W - WATER POLLUTION
S - SOLID WASTE OR LAND UTILIZATION

SOURCE: AMERICAN IRON AND STEEL INSTITUTE, 1972
STEELMAKING FLOW CHARTS

Once the molten steel is prepared, it is ready for casting. Currently, there are two routes for this process, conventional and continuous casting. With both processes, the molten steel is poured into a ladle. The relationship between these two techniques is depicted in figure 16.

FIGURE 16

CASTING PROCESSES FOR STEEL PREPARATION


A
A
A
W
W
FURNACE
LADLE
(Teeming)
MOLD
INGOTS (SOAKING PIT)
REHEAT FURNACE
ROUGHING MILL
FINISHING MILL
E
E
A
W
A
CONTIN- UOUS CASTING
TORCH CUT- OFF
E
CONTINUOUS CASTING

LEGEND: A - AIR POLLUTION
W - WATER POLLUTION
E - ENERGY REQUIREMENT

SOURCE: AMERICAN IRON AND STEEL INSTITUTE, 1972
STEELMAKING FLOW CHARTS

In the conventional process, molten steel is poured into a mold. When its exterior surface solidifies, the ingot is transferred to a soaking pit until the entire block is of uniform temperature. When the ingots are ready, they are transferred to the roughing and finishing mills where the preliminary shapes of the steel products are made. The continuous casting process essentially short circuits the ingot formation and treatment steps; molten steel is poured through a tundish into a water-cooled mold where a "skin" is formed on the outside of the liquid steel. As the moving column of steel is cooled, it eventually solidifies throughout. At this point it is cut into segments. From this stage processing is almost identical to that used for ingots.

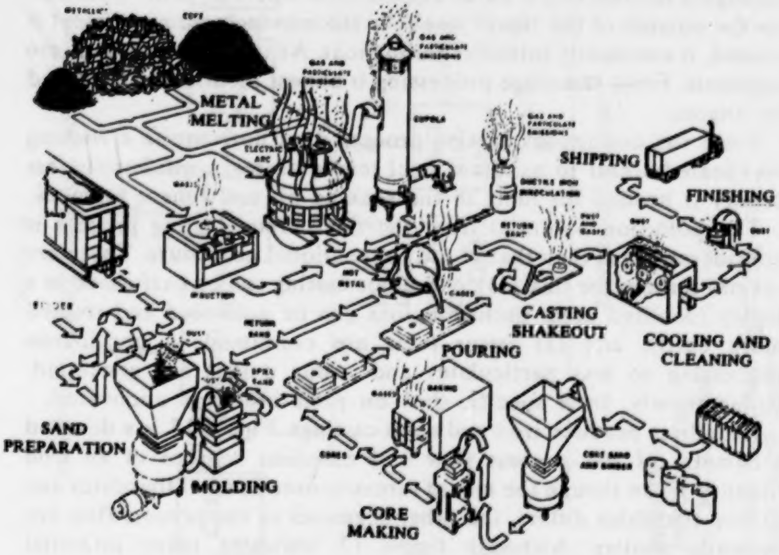
Since the continuous casting process does not require a soaking pit (heated areas) to maintain steel temperatures, considerably less energy is needed for fuels in the soaking pit and reheat furnaces.

The pollution potential from the continuous casting process is considerably less than that of the conventional procedure. There are several reasons for this: (1) continuous casting can be performed in a highly localized area, thus emissions can be collected and treated more easily, and (2) fewer fuels are consumed in continuous processing so less particulates and sulfur oxides are generated. Unfortunately, little specific data on pollution were uncovered.

Foundries produce iron and steel castings. Figure 17 is a detailed schematic of the process flow and emission sources of an iron foundry. Even though the mix of furnaces used in steel foundries and in iron foundries differs, the other segments of the process flow are basically similar. Although figure 17 indicates many potential emission sources, the most significant, in terms of actual amounts of materials discharged, are the furnaces.

FIGURE 17

IRON FOUNDRY PROCESS FLOW
SOURCES OF EMISSIONS


METALLICS
COKE
GAS AND PARTICULATE EMISSIONS
GAS AND PARTICULATE EMISSIONS
METAL MELTING
CUPOLA
GAS AND PARTICULATE EMISSIONS
ELECTRIC ARC
SHIPPING
GASES
DUCTILE IRON INOCULATION
FINISHING
RETURN SAND
DUST AND GASES
DUST
DUST
INDUCTION
HOT METAL
GASES
BINDER
RETURN SAND
DUST
CASTING SHAKEOUT
COOLING AND CLEANING
POURING
DUST
SPILL SAND
GASES
BAKING
SAND PREPARATION
CORES
CORE SAND AND BINDER
MOLDING
CORE MAKING

¹SOURCE: A. T. KEARNY & CO., 1971, VOL. II

During the course of the study two problems were identified. First, there were significant gaps in the data available. Those pollutants for which data were not available are not discussed in this section since they could not be considered in these quantitative analyses. Second, in several cases when more than one source was available, comparability problems could not be resolved. When this occurred both values are presented.

Pollutants generated in steel and foundry production affect all three elements of the environment, air, water, and land. Because it is the major source of pollutants, it has also been evaluated in detail and a large amount of data is available. The data for (1) uncontrolled air emissions are presented in table 46, and (2) uncontrolled water pollution and energy are presented in table 47.

TABLE 46

Uncontrolled air emissions for steel and foundry production activities
(In pounds/ton of activity)

Process/step	Particulates	SO_x	NO_x	CO	Other	Data sources[12]
Coke production:						
Transfer and handling	15					
Oven	3-20	4	.04	1.9	[1].18	5, 5, and 27
					[2]4.2	27
Byproduct plant	2.1	5.5				5
Quench	.3-4					5 and 7
Sintering:						
Sintering machine	44	1.97		44		4, 7 and 27
Sinter cooler	22					4
Blast furnace	55					4
Open hearth	[3]8-22	.7				4 and 7
Basic. oxygen	46	.03				4, 7 and 27
Electric arc	[4]12-50	.01		18		4 and 27
Iron foundries	[5]16-21			99-220		9, 10 and 27
Steel foundries	[6].1-40			0-.2		9, 10 and 27
Electric utilities:[7]						
Bituminous coal	[8]2	[9]5	2.9	.13	[10].04	7, 15 and 27
Fuel oil	.19	[9]3.7	2.5		[10].046	7, 15 and 27
					[11].023	
Natural gas	.05	.002	1.32	.0014	[10].0014	7, 15 and 27
					[11].027	

[1] Ammonia

[2] Hydrocarbons

[3] With and without lance

[4] Range due to scrap cleanliness and use of lance

[5] Include reverberatory particulates

[6] Depends on type of furnace used

[7] Units are in pound/MWe produced

[8] Times ash content, in percent

[9] Times sulfur content, in percent

[10] Hydrocarbons

[11] Aldehydes

[12] Numbers refer to references at end of report

TABLE 47

Uncontrolled water pollutants from and energy requirements for steel and foundry production activities
(in pounds/ton of activity)

Process/step	Water (suspended solids)	Energy (KWHR/ton of activity)	Data sources[5]
Coke:			
By product plant	[1].3, [2].3, [3].5		
Blast furnace	55	4209	6, 7
Open hearth		1123	4, 6
Basic oxygen	40	366	4, 6, 7
Electric arc	10	1630-2000	4, 6, 7
Conventional casting		1900	4, 6
Iron foundries		311-401	9, 10
Steel foundries		1420-1620	9, 10

[1] Cyanide
[2] Ammonia
[3] Phenols
[4] Includes recycled coke oven gas
[5] Numbers refer to references at end of report

Three modes of transportation are used: water, truck, and rail. The expected air emissions for these modes in 1975 are given in table 48. The data are averages for the complete U.S. transportation system. The emission data are given on a ton-mile basis. To convert raw material requirements to transportation requirements and, therefore, emissions, average mileage for each raw material by mode of transportation is required. These data are summarized in table 49.

TABLE 48

Air emissions and energy consumption for transportation modes

Mode	Air emissions (pounds/thousand ton-miles)					Energy (KWHR/Thousand ton-miles)
	Particulates	SO_X	NO_X	CO	Hydrocarbons	
Water	.2	.89	.72	5.9	1.1	120
Truck	.4	.5	8	80	6	2100
Rail	.11	.28	.33		.22	180

Data Source: 8

TABLE 49

Transportation required to move raw and recyclable materials
(in miles)

Mode	Coal	Flux	Ore	Scrap
Rail	134	76	249	141
Truck	4	85	0	0
Boat	116	63	402	22

Source: 8

Except for transportation, the data presented in the preceding section are for uncontrolled emissions. In the near term and long term, many of these emissions will be controlled. To account for these changes in control, uncontrolled emission data were modified. For the near term, efficiencies of available techniques and current levels of application were used when data were available. For the long term, estimates of percent of emission removed were made based upon the efficiencies of currently available technologies and projected increases in the degree of application. When no data were available, zero control was assumed for the near term and 50 percent removal was selected for the long term level of control. The data on the near-term and long-term controls used in the study are presented in tables 50 and 51.[7]

---

[7] Figures in table 50 may be altered in the future as a result of guidelines to be published by the Environmental Protection Agency pursuant to the Federal Water Pollution Control Act Amendments of 1972.

TABLE 50

Summary of uncontrolled loadings and near term and long term controls

Process	Pollutant	Uncontrolled (#/ton of activity)	Near term		Long term (percent removed)	Data sources[1]
			Control efficiency (in percent)	Control application (in percent)		
Extraction and processing:						
Iron ore	Particulates	7.5	90	35	63	13
Coal	Particulates	12	95	80	90	13
Limestone	Particulates	51	80	25	40	13
Lime (from limestone)	Particulates	140	93	82	90	13
Steel production:						
Coke production	Particulates	30.5	0	0	50	13
	SO_x	9.5	95	0	50	18
	NO_x	.04	0	0	50	
	Ammonia (air)	.18	0	0	50	
	Hydrocarbons	4.2	0	0	50	
	CO	1.9	0	0	50	
	Cyanide	.3	90	35	63	30
	Ammonia (water)	.3	90	35	63	30
	Phenols	.5	90	35	63	30
Sintering	Particulates	66	90	100	90	13
	SO_x	1.97	95	0	50	18
	CO	44	0	0	50	
Blast furnace	Particulates	55	99	100	99	13
	Suspended solids	55	95	40	76	30

Summary of uncontrolled loadings and near term and long term controls—Continued

Process	Pollutant	Uncontrolled (#/ton of activity)	Near term		Long term (percent removed)	Data sources[1]
			Control efficiency (in percent)	Control application (in percent)		
Open hearth	Particulates	15	97	41	80	13
	SO_x	.7	95	0	50	18
Basic oxygen	Particulates	46	99	100	99	13
	SO_x	.03	95	0	50	18
Electric arc	Suspended solids	40	95	40	76	30
	Particulates	31	99	79	99	13
	SO_x	.01	95	0	50	18
Iron foundries	CO	18	0	0	50	
	Suspended solids	10	95	40	76	30
	Particulates	18.5	80	33	52	13
	CO	160	0	0	30	13
Steel foundries	Particulates	20	80	33	52	13
	CO	.1	0	0	50	

---

[1] Numbers refer to references at end of report. For those data elements with no source given, data is developed using guidelines presented in the report.

TABLE 51

Long term controls on transportation emissions
(percent reductions in 1975 levels)

Emission	Truck
Particulate	45
SO_x	4
NO_x	0
CO	42
Hydrocarbons	75

Data Source: 8
Note: Water and rail emissions will remain at 1975 levels.

A comparison of environmental impacts for the production of carbon steel using a 100-percent ore charge in a BOF and using a 100-percent shredded auto hulk charge in an electric furnace has been provided by the U.S. Environmental Protection Agency (EPA). The figures shown in tables 52 and 53 appear to point up a significant difference in the environmental impacts of the two systems. It should be noted, however, that the figures shown rely on a hypothetical set of circumstances that have not been shown to exist anywhere in the country. For example, as shown in part I(B)(3), BOF charges of metallic inputs normally consist of approximately 71 percent iron ore and 29 percent scrap iron, not 100 percent ore as shown in the EPA example. Electric furnace charges normally consist of 97 percent scrap and 3 percent iron ore, not 100 percent scrap as shown in the EPA example. Further, due to the varying chemical consistencies and varying melting speeds of scrap iron and steel, it is unlikely that a charge of 100 percent shredded auto hulk scrap is at all efficient, if indeed it is possible. With these caveats, the EPA data are presented unchanged.

TABLE 52

Comparison of environmental impacts for the production of carbon steel using virgin and/or recycled materials
(per 1 ton of carbon steel ingot)

	System I BOF, virgin materials	System II electric furnace, auto shredder scrap
Material inputs (pounds)		
Raw Materials:		
Iron ore	2,747.8	
Limestone	768.7	146.7
Fluorspar	14.3	5.9
Other fluxes	16.7	4.2
Total raw materials	3,547.5	156.8
Home scrap	732.6	765.6
Obsolete scrap		1,786.4
Total all materials	4,280.1	2,708.8
Water discharged (gallons)		
Process	20,226.4	180.3
Mine drainage	95.04	16.6
Total water	20,321.44	196.9
Air emissions (pounds)		
Particulates	21.31	2.2
Sulfur oxides	6.7	6.3
Carbon monoxide	2.1	6.8
Hydrocarbons	3.9	3.8
Nitrogen oxide	4.1	7.8
Aldehydes	0.05	0.06
Organics	0.02	0.06
Ammonia	0.14	
Total air emissions	38.31	27.02
Water pollutants (pounds)		
Suspended solids	0.06	
Dissolved solids	2.45	0.61
BOD	0.0088	
Oil and grease	0.004	0.004
Iron	0.004	

Comparison of environmental impacts for the production of carbon steel using virgin and/or recycled materials—Continued
(per 1 ton of carbon steel ingot)—Continued

	System I BOF, virgin materials	System II electric furnace, auto shredder scrap
Water pollutants (pounds)—Continued		
Phenols	0.0004	
Sulfide	0.0004	
Ammonia	0.011	
Cyanide	0.0002	
Fluoride	0.0242	
Total water pollutants	2.5630	0.614
Solid wastes (pounds)		
Overburden	14,633.0	2,663.2
Process	10,650.2	246.4
Post-consumer		-1,955.8
Total solid waste	25,313.2	943.8

Source: Studies prepared by independent contractors for EPA.

TABLE 53

Comparison of environmental impacts for the production of carbon steel using virgin and/or recycled materials
(per 1 ton of carbon steel ingot)

Energy consumption (in thousands of BTU)	System I BOF, virgin materials	System II electric furnace, auto shredder scrap
Iron ore mining	1,898	
Limestone mining	81	15
Lime production	412	157
Blast furnace area	14,687	
Oxygen production	663	131
BOF	619	
Auto hulk processing		190
Auto scrap processing		708
Electric furnace		7,104
Total	18,360	8,305

Source: Studies performed by independent contractors for EPA.

Part I(C)(1): Transportation of scrap iron and steel, transportation characteristics

In part I(A)(3) the general transportation characteristics of scrap iron and steel are outlined. We have also provided information as to the locations of the sources of supply and demand for this commodity in parts I(A)(1) and I(B)(2). Further, in part I(C)(1) of Ex parte No. 270 (Sub-No. 5), Investigation of Railroad Freight Rate Structure—Iron Ores, we have presented detailed information explaining the facets of iron ore movements that make up the overall rail transportation characteristics on upper lake and ex-water movements of iron ores. This section will present, in some detail, the transportation characteristics of scrap and will make comparisons between the transportation characteristics of scrap and iron ores.

Tables 54 and 55 show the major origin and destination States and tonnages of scrap iron and steel shipped or received for 1966, 1969, and 1972 as reflected by waybill sample data. Also shown is the number of States receiving shipments from particular origin States for each of the 3 years.[8] These data do differ somewhat from figures to be presented in part I(C)(2). However, these data have been compiled by totaling the numbers of origin and destination points given in the representative movements presented by the parties and are not intended to reflect amounts of traffic moved. The large number of States which are both major origins and destinations indicates that much of the movement of scrap is intrastate. This indication is supported by the finding made in part I(C)(2) that in excess of 35 percent of the representative movements are intrastate.[9]

---

[8] The irregular nature of movements caused by the large number of shippers and receivers is exacerbated by short-term fluctuations in movements. Although the demand for scrap is not cyclical, demand patterns caused by changes in the demand for steel are irregular, creating difficulties in terms of car supply and labor requirements.

[9] Much of the intrastate traffic involves intraterminal and interterminal switching. Those movements, while brief in terms of distance, often require 10-20 days of car usage from location of an empty car to retrieval of the unloaded car even though actual time from pickup to delivery is only 3-6 days.

TABLE 54

Iron and steel scrap, origins

Origin State	Tons			Number of States receiving shipments		
	1966	1969	1972	1966	1969	1972
		(Millions)				
California	1.619	1.490	0.929	11	7	7
Illinois	2.196	2.536	2.357	15	13	16
Indiana	2.462	2.722	2.294	10	10	15
Maryland	0.609	0.489	0.453	5	5	5
Michigan	2.694	2.871	3.092	10	8	16
New Jersey	0.699	0.667	0.411	9	3	6
New York	0.958	0.954	0.913	10	6	12
Ohio	3.356	4.532	3.436	12	8	12
Pennsylvania	4.695	4.956	4.358	11	11	8
Texas	0.742	1.103	0.780	10	5	8
Wisconsin	0.890	0.647	0.978	9	5	10
Others[1]	5.475	6.837	6.658			
Total	26.395	29.804	26.659			

Source: Carload Waybill Statistics, 1966, 1969, 1972.

[1] 36 States in 1966, 41 States in 1969, and 36 States in 1972. In 1972, Kentucky and Minnesota were among the top 11 States shipping scrap having exceeded the production of Maryland and New Jersey.

TABLE 55

Iron and steel scrap, destinations

Destination States	Tons		
	1966	1969	1972
		(Millions)	
Alabama	0.659	1.097	0.930
California	1.464	1.282	0.809
Illinois	3.344	2.849	4.020
Indiana	1.406	1.160	0.980
Michigan	1.484	1.819	1.775
New York	0.687	0.706	0.395
Ohio	4.779	5.296	4.195
Pennsylvania	5.881	6.687	6.134
Texas	0.880	1.306	0.872
West Virginia	0.701	0.566	0.606
Wisconsin	0.547	0.494	0.362
Others[1]	4.564	6.542	5.581
Total	26.395	29.804	26.659

Source: Carload Waybill Statistics, 1966, 1969, 1972.

[1] 31 States in 1966, 27 States in 1969, and 29 States in 1972. In 1972 Tennessee and Minnesota were among the top 11 States in the consumption of scrap having exceeded the consumption of New York and Wisconsin.

As previously noted, scrap iron purchased by the steel industry (on a delivered price basis including freight charges)[10] is generally obtained through brokers who may or may not also be processors. As a consequence of the broker arrangement, shipments of purchased scrap iron, to a great extent, are subject to reconsignment or diversion orders from the time they are released to the railroads at the point of loading until their delivery to the steel mills.

The broker arrangement also allows single-car shipments of scrap to be joined prior to delivery to the steel mills. Carloads of scrap are delivered to steel mill interchange tracks as part of a train of miscellaneous commodities. Typically, an inbound train of miscellaneous commodities will contain 45-50 cars of which 10-12 cars are loaded with scrap. These single carloads of varying grades of scrap are usually scattered throughout the train. Steel company crews take over at the interchange tracks for weighing, classifying, and switching the cars to designated yards within the mill confines.

Carloads of scrap are switched to a yard where their contents are analyzed. Next the cars are assembled into seven- to nine-car settings which are then moved to the steelmakings shops. The variations between the numerous grades of scrap, including home scrap, require that it be mixed in the steelmaking shop in reasonably precise proportions, as determined by production personnel. Thus it is not unusual to have as many as five different grades of scrap in each seven- to nine-car setting of scrap at the steelmaking shop. To assure the continuity of flow of proper quantities of each grade of scrap, rolling inventories of cars (Inland Steel reports 350 in its inventory) are maintained.

Scrap basically moves under single-car rates in 48-foot high-side gondola cars with wooden floors from widely dispersed origins and in relatively small quantities in terms of carloading and shipment size. Average loading per car of scrap iron is 55 net tons.

Normal allowable free time for loading and unloading (performed by the consignor and consignee) was 48 hours in 1973, the same as generally applied on other domestic freight. Scrap is generally loaded by "clamshell loaders" and unloaded by magnetic cranes. Scrap iron and steel is piled up throughout the loading yard. It is often piled very near (and sometimes on) the tracks used for loading. On occasion, switching crews are forced to wait until the industry employees have cleared off the track before the work can proceed.

---

[10] An exception to the rule is the sale of scrap by large industrial plants such as the automotive companies who generally insist that prices be quoted f.o.b. shipping point. If a mill bids direct and is awarded the material, the orders will be issued f.o.b. shipping point, but if a broker is involved, the price will be on a delivered mill basis even though the railroad freight charges are merely added to the price.

In addition, this condition creates a safety problem caused by the close clearances which surround the tracks. Unlike a close clearance between a building or a loading dock which remains stationary and which the crews become accustomed to avoiding, these clearance problems vary in location from day to day. Thus, crews must be constantly on the alert for these scrap piles and this, in turn, further increases the time needed to handle scrap iron.

The use of magnetic and clamshell cranes and the dropping of the scrap from above the gondola car causes damage to the car that is normally not sustained in loading other traffic. These damages include damage to safety equipment such as ladders and brake wheels as well as damage to the sides and floor of the car itself. When the scrap is dropped from the cranes, it sometimes misses the car. This also adds to the problems noted above and can cause derailments when it falls in between cars and onto the tracks. Finally, scrap which is loosely piled within a car can shift during movement and cause scrap to hang over the sides of the car, creating a potential safety hazard to passing trains and unsuspecting employees.

Because average weighing agreements for the movement of scrap are not feasible, every carload must be weighed. Frequently the cars are weighed twice at the origin point; once empty to determine tare weight and once after being loaded. This weighing is performed to (1) ascertain weights for initial billing purposes, and (2) determine that the cars are not loaded in excess of their stenciled load limit.[11] As shipping charges are normally assessed on the basis of destination weight agreements, receiving steel mills again weigh the cars loaded and empty on their own scales or order them weighed on the delivering railroad's scales. While the various accessorial charges for reweighing, reconsignment, and diversion, where and when applicable, are assessed in addition to the freight rate from origin to destination, the process of weighing up to four times for each carload and the performance of other accessorial services decreases operating efficiency and efficient car utilization.

Scrap is normally handled over multiple lines with several interchanges between different railroads involving complex and costly switching. Both frequent interchange and circuity characterize most scrap rail movements. Moreover, because of its physical nature, scrap normally involves more complicated, cumbersome rail handling.

---

[11] Overloaded cars must be switched back to the shipper for partial unloading.

Statistics have not been presented to quantify the extent to which cars moving scrap to steel mills are also utilized for outbound shipments of other commodities, but this usage appears to be substantial.

The Chicago, Milwaukee, St. Paul and Pacific Railroad Company (Milwaukee) has provided examples of the steps involved in the movement of a single car of scrap from origin to destination. The information provided involves a line-haul movement from Lake, Wis., to Chicago, Ill., and a crosstown switching movement in Milwaukee, Wis. These movements may be considered representative but should not be considered to reflect the precise operating conditions on all line-haul and switching movements of scrap.[12]

Typically, for the Milwaukee, when the scrap dealer at Lake wishes to make a shipment of iron or steel scrap, it orders the car or cars it will require by telephoning the local agent at Lake. This agent will take the order for the car or cars, and if none is available at Lake he will telephone the necessary information to the closest car distributor, which in this instance would be located at Muskego Yards at Milwaukee. The car distributor at Muskego Yards must ascertain from his onhand listing if such cars are available. If the necessary cars are available, he will place appropriate switching orders with the perpetual inventory car location clerk who will cut an IBM card or cards representing the car or cars to be used for this order.

If no cars are available locally, the car distributor at Muskego will transmit the order to the transportation department at Chicago, which will examine its car inventory on the entire Milwaukee Road system and direct such empty cars as are available to be earmarked for the Lake order. Cars to be used for this order can come from any point where they become available and may travel empty for very substantial distances before arriving at Lake to be loaded. Because of the distances involved, it might possibly take anywhere from several days to more than 1 week to move the required empty cars to Muskego Yards from which point they will be moved to the loading point at Lake.

---

[12] The complexity involved in these movements suggests room for increased efficiency. Outside experts may be required to suggest methods to cut down the number of unnecessary movements of scrap cars.

By the time the requested empty cars arrive at Muskego Yards for ultimate movement to Lake, they have very likely been moved through various train yards and have been handled in numerous trains before arriving empty at Muskego. For example, if it is ascertained that an empty car needed for a movement from Lake is available on a track adjacent to a shipper's place of business at Chicago, that car must first be removed from the shipper's track by a switch engine, and then placed in a transfer train which will move it to the main yard at Bensenville, Ill. Upon arrival at Bensenville, the block of cars containing the desired empty gondola must then be moved by a hump engine over the hump track and switched to the proper classification track, which in this instance would be that track marked for Milwaukee. From this point an engine will couple into the entire block of cars and move it to the main departure yard, where it will be consolidated with cars already lined up to go to Milwaukee.

When this through train is finally cleared for departure from Bensenville, it moves out over the main line to Milwaukee where it arrives at Muskego Yards and is placed on a designated track. The engine is then cut off from the through train, and all cars are visually checked by carmen to determine if there are any bad-order cars in the train and if any loads therein have shifted which could cause a safety hazard. The train consist must then be checked by a manual pull-by inspection against available waybills and properly coded as to the next destination or consignee. A new hump list is then prepared by use of a computer and given to the yardmaster in charge who will then arrange for a hump engine to couple into the train and move it over the hump for switching to a designated track. When the train is moved over the hump track in this manner, the empty cars therein which were designated to fill the order at Lake, Wis., are placed in a separate transfer track earmarked for Lake. Each evening at approximately 11 p.m., the cars on this transfer track are coupled into by a switch crew and moved the 7.1 miles to Lake where they are there set out on one of the available yard tracks. Appropriate waybills and transfer lists identifying the cars are taken to Lake by messenger service each evening and deposited in a waybill box installed for this purpose. Five days per week the local switch engine at Lake will, upon orders from the agent, couple into the cars on the yard tracks at Lake and move these cars to the designated loading spot at the consignor's place of business. The agent notifies the consignor that the cars have been placed for loading and then makes note of the necessary information to control any demurrage that may accrue on the cars, including time of arrival, order date, and spotting date and time.

The consignor now proceeds to load the car. When the car is finally loaded, consignor notifies the agent at Lake and presents bill of lading for signature. The agent then notifies a switch crew to pull the car and place it in a transfer train which is designated to go to Muskego Yards.

The agent then prepares a waybill for the shipment and places it with all of the transfer waybills in the bill box for messenger pickup that evening. Copies of the waybill are sent to the railroad's accounting office for abstraction which is the railroad's bookkeeping method to derive its share of the revenue and which provides the various statistics to meet the Commission's and railroad's accounting requirements. The agent releases the car on a demurrage record and prepares a demurrage bill for any charges due. A switch crew bringing cars to Lake each evening will pick up the cars on the transfer track and return them to Muskego Yards placing the transfer on a designated track.

Upon arrival at Muskego Yards, a pull-by list is then made and cars are properly coded for their next destination. IBM cards are punched to represent each car and placed in the memory bank of the computer. A hump listing is also prepared and given to the yardmaster.

At a designated time the yardmaster instructs a switch engine to couple into the transfer track and to move cars over the hump. Cars are switched into the properly designated track. Periodically, some cars containing iron or steel scrap are check-weighed; the reason for this check-weighing is a preventative measure that is practiced on most railroads to prevent the movement of overloaded cars in main line trains which can create costly train derailments. If a car of scrap iron is overloaded, it is returned to the consignor for reduction of load, after which the same handling procedure must be followed again. This happens quite frequently.

Clerks prepare a train list and wheel report and pull matching waybills from the waybill rack. This information and paperwork is given to the conductor of the through train which is going to move the involved car or cars of scrap iron in road-haul service. Assuming the car or cars of scrap have been consigned to Chicago, a train departure and advanced consist list is again fed into the Chicago computer and retransmitted to Bensenville Yards at Chicago. The through road-haul then reverses the procedure outlined above and moves to Bensenville.

Upon arrival at Bensenville, the train carrying the involved cars of scrap iron is placed on a specified track in the switch yard. After a physical pull-by check is received by the clerical forces, a match is made of waybills moving with the train; the diversion book is checked for any possible diversion of cars; and each car is coded for its destination in the Chicago area. This information is fed to the computer, and a hump switch list is prepared and given to the yardmaster. Again, the cars are physically inspected by car department forces to locate any bad orders or shifted loads.

After the train is checked, a yardmaster instructs a switch engine to couple into the train and move it over the hump. Cars are switched into properly designated departure tracks, which in the case of the scrap would be a transfer track to a connecting line because the Milwaukee does not directly serve any of the Chicago area steel mills.

After the transfer track is full, another switch engine will couple into the interchange train, and upon proper clearance will move it to the connecting road's yards and place cars on a designated interchange track.

When a physical pull-by list is received by the clerical forces, waybills of switch bills will be pulled from the waybill rack to match each car. Along with a prepared list, the bills will be delivered to the connecting line in some instances by the conductor or, if time is short, a messenger. Information which specifies time and date of interchange is fed into the computer at Bensenville, and at Chicago an official interchange document is prepared and sent to the connecting line for signature. Also, the proper record is placed in the computer for printing of car records and per diem payments.

The connecting line serving the consignee in Chicago has numerous yard locations that the car or cars will have to move through before arrival at the consignee's place of business. The consignee must also be notified, proper demurrage records must be made, and the car will be held until the consignee's order. When this is received the car is then handled by a switch engine and is normally moved over track scales to determine the gross weight of the car. After unloading, the car is then moved to the scale again to determine actual tare weight. The car is returned through the same switching procedure to Bensenville Yard where it will be applied against any existing order.

While all of the above may seem somewhat detailed, it is, nonetheless, the typical operation for handling road-haul movements of cars of iron or steel scrap.

The Milwaukee handles a considerable number of cars of iron or steel scrap which moves in crosstown switching service, i.e., either an intraterminal or interterminal switch move. A case in point is at Milwaukee where there are regular movements of scrap from factories or scrap dealers to boat docks or scrap processors. Movements of this nature require considerable service, which can approach the detailed complexity of a line-haul movement, but for which only a switch rate is paid.

On such crosstown movements of scrap empty cars are ordered in the same manner as line-haul shipments and empty cars furnished will travel the same routes as cars furnished for line-haul movement. For example, a normal movement from Pioneer Iron & Metal to Miller Compressing Company will be used.

An empty car is placed and removed from the industry by a switch engine located at Glendale Yard. From Glendale the loaded car moves in a transfer train to Muskego Yard, which is the main marshalling yard in Milwaukee. Here it is handled over a hump switch and placed in a track designated to weigh, as weights are needed for the assessment of switching charges. The car is then handled by another switch crew to the scale track, weighed, and then placed on a track designated as Bay View transfer (Stowell District).

A Bay View transfer crew moves car to the Stowell Yard. After arrival at Stowell Yard, Miller Compressing is notified and the car is moved by yet another switch crew to the spot designated by Miller Compressing and is then unloaded and handled in the same manner as a line-haul shipment.

It must be noted that under normal circumstances, a total of five separate crews and engines are required to handle this intraterminal movement; however, the railroad is able to assess only a switch charge.

In case of an overload, which is frequent, the car must reverse itself and go back to the industry to be reduced and then start out again in the same manner as described above.

The Commission has commented on the differences between the transportation characteristics of scrap and iron ore in many previous cases. In Ex Parte Nos. 265 and 267, *Increased Freight Rates, 1970 and 1971,* 339 I.C.C. 125, 207 (1971), it was stated:

> There are differences in the transportation service performed by the railroads in connection with ferrous scrap and iron ore, including differences in the average length of haul, average weight per car, average size of shipment, and regularity of movement and general distribution.

In Ex Parte No. 281, *Increased Freight Rates and Charges, 1972,* 341 I.C.C. 290, 411 (1972), the differences in transportation characterized were summarized as follows:

> Respondents note that important differences exist in the transportation service performed by the railroads in connection with shipments of ferrous scrap and iron ore, including differences which bear on the relative costs of moving these commodities such as average weight per car, average length of haul, number of carloads per shipment, and regularity of movement.

Respondents developed comparisons of such factors for iron and steel scrap and iron ore from Statement No. TD-1, Carload Waybill Statistics—1969. In each instance the transportation characteristics of iron ore are superior. Thus, the average weight per car of iron ore within official territory is shown to be 77.5 tons compared to only 55.5 tons for ferrous scrap. Similarly, the average length of haul for iron ore within official territory is 188 miles, compared to only 106 miles for ferrous scrap. Typically, iron ore is handled in large volumes and frequently in trainload quantities of 100 or more cars; iron or steel scrap which may be originated or terminated in multiple-car cuts is frequently moved at the rate of a single car per day. The waybill data for these two commodities follow:

	Sample size (waybills)	Carloads	Carloads per waybill
		Iron or steel scrap	
U.S. to U.S.	994	5,270	5.3
Official territory	712	3,625	5.1
		Iron ore	
U.S. to U.S.	266	19,150	72.0
Official territory	86	4,550	53.0

At 413, *supra,* our findings on the transportation characteristics of the two commodities were summarized as follows:

> *** their transportation characteristics—including differences in average weight, length of haul, size of shipment, regularity of movement, and general distribution—are materially different.

As early as 1962, the Commission had occasion to note differences in the transportation characteristics of the two commodities. In *Institute of Scrap Iron & Steel, Inc.,* v. *Akron, C. & Y. R.,* 316 I.C.C. 55, 56, 62, 67, the Commission noted that:

*** Scrap iron ranges from very light to very heavy. Turnings are an example of light scrap and usually weigh between 45,000 to 58,000 pounds per car. Unprepared scrap generally averages less than 44,800 pounds. No. 1 heavy melting scrap is the most expensive of the many grades of scrap iron and usually loads from 96,000 to 125,000 pounds.

* * * * * * *

*** By contrast, scrap iron moves from many points, 501 origins in a typical month. A study made by the Bethlehem Steel Company showed 263 origins, with individual plants receiving scrap from as many as 115 origins. Although the origin and destination points for iron ore are constant from year to year, there are frequent changes in the origins from which particular mills obtain their scrap.

The average weight per carload differs widely, iron ore loading in excess of 70 net tons and scrap to 50 net tons. While iron ore moves largely over single-line direct routes, scrap moves over a multiplicity of routes, some of which are extremely circuitous. Because iron ore is frequently delivered to the railroads in quantities in excess of trainloads, it does not require the very expensive terminal services involved in way train and classification-yard services which are characteristic of the movement of any commodity such as scrap, where the typical movement is a single carload. Both iron ore and scrap are transported in open-top equipment, but this is true of about 58 percent of all the carload traffic within official territory.

* * * * * * *

*** As noted, the transportation characteristics of iron ore *** and scrap differ widely.[13]

In the instant proceeding, the record contains an extensive list of comparisons between the transportation characteristics of scrap iron and steel and iron ores. For purposes of analysis the comparisons made are summarized below:

1. Scrap moves from many origin points to many consumption points. Iron ore moves from significantly fewer origin points to a lesser number of consumption points.
2. Scrap moves predominantly in single-car lots. Iron ore moves predominantly in trainloads.
3. There is no consistent pattern of scrap movements on which the railroads can rely. Iron ore is regularly moved from the same origin to the same destination and car requirements are easily established.
4. Both scrap and iron ore cars are, on occasion, utilized for backhauls of other commodities. The relative number of such loaded backhauls is unknown.

---

[13] The Bethlehem Steel Company study is confirmed in this proceeding by the 1973 experience of Inland Steel Company which reports that its 49 largest suppliers of scrap provided only 25 percent of the total amount purchased.

5. Switching services on scrap shipments are performed for single cars. Switching services on iron ore shipments are performed for multiple-car or trainload quanities at considerably less expense per car.

6. Loading and unloading of scrap cars takes considerably longer than loading and unloading of iron ore cars.

7. More weighing services are provided for scrap cars than for iron ore cars.

8. Scrap loading, unloading, and transportation does more damage to cars than does similar service for iron ores.

9. Loading and weighing services are not integrated for scrap movements but are integrated for iron ore movements.

10. Scrap movements have a higher incidence of diversion and reconsignment orders than iron ore movements.

11. Scrap loads lighter than iron ores.

12. Scrap often requires intra- and interterminal switching services. Iron ores do not require these services to the same extent.

13. Single-car movements of scrap have higher expenses attributable to line-haul service, origin, intermediate, and destination switching service, and clerical service than apply, per car, on the normal unit-train movement of iron ores.

The Coordinator is convinced, on the basis of the comparisons made, that the transportation characteristics of scrap iron and steel do not compare favorably with the transportation characteristics of iron ores. On a per-ton basis services provided on scrap movements are considerably more costly to the railroads than are the services provided on movements of iron ores. Any comparison made of rates applicable on movements of scrap iron and steel and movements of iron ores must begin with a recognition of the differences in transportation characteristics noted above.

Part I(C)(2): Routes of movements

As the representative rates on movements of scrap iron and steel presented by the parties do not lend themselves to an analysis based upon origin and destination groupings or to an analysis based upon various combinations of transportation services, it will be the purpose of this section to first present an overview of all the data provided and then to present an overview based upon the origin territory of each representative rate. As noted in the previous section, figures presented in this section are meant to reflect only the numbers of representative rates provided by the parties and, thus, will not strictly equate with actual numbers of movements or actual tonnages moved.

A total of 394 rates have been analyzed in this study. These rates include movements in all three origin territories and specifically include rates from 36 origin States to 29 destination States. As previously explained, the large number of States involved in this study are accounted for because of the potential for iron and steel scrap production in any major population or manufacturing center, on the one hand, and the relatively small size of electric furnaces, on the other.

As can be seen in table 56, the eight States most commonly found as origin points account for approximately 54 percent of the origin points considered.

TABLE 56

Origin States of representative rates

1. Michigan	39
2. Illinois	36
3. Minnesota	26
4. Wisconsin	24
5. Pennsylvania	23
6. New Jersey	23
7. Ohio	21
8. Indiana	20
Subtotal or 53.8 percent	212
9. Mississippi	17
10. Tennessee	16
11. Kentucky	14
12. California	13
13. Missouri	12
14. Oklahoma	11
15. Alabama	11
16. Georgia	10
17. Texas	9
18. Iowa	8
19. New York	8
20. North Carolina	7
21. Michigan	5
22. Florida	5
23. Kansas	4
24. Arkansas	4
25. South Carolina	4

Origin States of representative rates—Continued

26. Virginia	4
27. Connecticut	4
28. Colorado	3
29. Maryland	3
30. Utah	2
31. North Dakota	2
32. Louisiana	2
33. New Mexico	1
34. Nebraska	1
35. South Dakota	1
36. West Virginia	1
Total rates	394

Table 57 lists the destination States of each of the considered rates. As shown by the subtotaled figure, the eight States most commonly found as destination points account for approximately 67 percent of the destination points considered. Five of the eight States, marked with asterisks, are also among the most common origin points.

TABLE 57

Destination States of representative rates

1. Illinois*	66
2. Pennsylvania*	47
3. Ohio*	44
4. Alabama	33
5. West Virginia	22
6. Texas	21
7. Michigan*	16
8. Minnesota*	15
Subtotal or 67 percent	264
9. Missouri	14
10. South Carolina	13
11. California	12
12. Wisconsin	12
13. Kentucky	11
14. Indiana	10
15. Louisiana	8
16. Oklahoma	8
17. Iowa	5
18. Virginia	5
19. Connecticut	4
20. Florida	4

Destination States of representative rates—Continued

21. Arkansas	4
22. New York	3
23. Tennessee	3
24. Colorado	3
25. Utah	3
26. Maryland	2
27. New Jersey	2
28. Georgia	2
29. North Carolina	2
Total rates	394

Considering only the representative rates on movements originating in official territory, typical routes of movement can be seen from an analysis of the origin and destination States provided by the parties. The figures indicate that 11 States within official territory are originating points for scrap iron and steel and that these 11 ship to 16 destination States. Representative rates on 174 movements originating in official territory were considered in this section or approximately 44.2 percent of the 394 rates given by the parties. Of the 174 total, 62, or 35.6 percent, were intrastate and 112, or 64.4 percent, were interstate. Table 58 shows the origin and destination States of all movements under representative rates originating within official territory and the number of representative rates between the considered States.

TABLE 58

Movements originating within official territory

Michigan-Michigan	11
Michigan-Ohio	11
Michigan-West Virginia	16
Michigan-Illinois	1
Pennsylvania-Pennsylvania	6
Pennsylvania-West Virginia	4
Pennsylvania-Ohio	10
Pennsylvania-Indiana	1
Pennsylvania-Maryland	2
Ohio-Ohio	13
Ohio-West Virginia	1
Ohio-Pennsylvania	1
Ohio-New York	3
Ohio-Michigan	3
New Jersey-New Jersey	2
New Jersey-Pennsylvania	21

Movements originating within official territory—Continued

Illinois-Illinois	23
Illinois-Wisconsin	2
Illinois-Iowa	1
Illinois-Michigan	2
Illinois-Indiana	1
Illinois-Texas	1
Illinois-Pennsylvania	1
New York-Pennsylvania	1
Indiana-Indiana	1
Indiana-Illinois	5
Indiana-Pennsylvania	7
Indiana-Ohio	4
Indiana-Kentucky	2
Indiana-Alabama	1
Connecticut-Connecticut	4
Virginia-Virginia	1
West Virginia-West Virginia	1
Maryland-Pennsylvania	3
Total rates	174

Typical routes of representative movements originating in western territory can be seen from an analysis of table 59. The figures indicate that 18 States within western territory are originating points for scrap iron and steel and that these 18 ship to 12 destination States. Representative rates on 132 movements originating in western territory were considered in this section or approximately 33.5 percent of the 394 rates given by the parties. Of the 132 total, 44, or 33.3 percent, were intrastate and 88, or 66.7 percent, were interstate. Table 59 also shows the origin and destination States of all movements under representative rates originating within western territory and the number of representative rates between the States.

TABLE 59

Movements originating within western territory

Illinois-Indiana	1
Illinois-Iowa	1
Illinois-Arkansas	1
Illinois-Missouri	2
Minnesota-Minnesota	10
Minnesota-Colorado	1
Minnesota-Indiana	2
Minnesota-Illinois	10
Minnesota-Wisconsin	3

Movements originating within western territory—Continued

California-California	11
California-Illinois	1
California-Utah	1
Louisiana-Texas	1
Texas-Texas	6
Texas-Oklahoma	2
Texas-Iowa	1
Wisconsin-Wisconsin	5
Wisconsin-Indiana	3
Wisconsin-Illinois	15
Wisconsin-Minnesota	1
Iowa-Iowa	1
Iowa-Illinois	6
Iowa-Indiana	1
Kansas-Missouri	3
Kansas-Oklahoma	1
Oklahoma-Oklahoma	4
Oklahoma-Missouri	4
Oklahoma-Texas	3
Missouri-Missouri	4
Missouri-Arkansas	1
Missouri-Oklahoma	1
Missouri-Illinois	4
Missouri-Texas	2
Colorado-Colorado	2
Colorado-Utah	1
New Mexico-Texas	1
Arkansas-Texas	4
Utah-Utah	1
Utah-California	1
North Dakota-Minnesota	2
Nebraska-Missouri	1
Michigan-Iowa	1
Michigan-Illinois	1
Michigan-Minnesota	2
Michigan-Wisconsin	1
South Dakota-Wisconsin	1
Total rates	132

Typical routes of representative movements originating in southern territory can be seen from an analysis of table 60. The figures indicate that 10 States within southern territory are originating points for scrap iron and steel and that these 10 ship to 12 destination States. Representative rates on 88 movements originating in southern territory were considered in this section or approximately 37.5 percent of the 394 rates given by the parties. Of the 88 total, 33, or 37.5 percent, were intrastate and 55, or 62.5 percent, were interstate. Table 60 shows the origin and destination States of all movements under representative rates originating within southern territory and the number of representative rates between the States.

TABLE 60

Movements originating within southern territory

Alabama-Alabama	9
Alabama-Kentucky	1
Alabama-Texas	1
Tennessee-Tennessee	3
Tennessee-Arkansas	2
Tennessee-Alabama	9
Tennessee-Kentucky	2
Mississippi-Louisiana	8
Mississippi-Alabama	9
Kentucky-Kentucky	6
Kentucky-Alabama	2
Kentucky-Ohio	6
Georgia-Georgia	2
Georgia-Alabama	2
Georgia-South Carolina	5
Georgia-Texas	1
Florida-Florida	4
Florida-Alabama	1
North Carolina-North Carolina	2
North Carolina-South Carolina	4
North Carolina-Virginia	1
South Carolina-South Carolina	4
Louisiana-Texas	1
Virginia-Virginia	3
Total rates	88

Part I(D): Transportation of scrap iron and steel (financial)

(1): Relationship of rate to demand for scrap iron and steel

As noted in part I(A)(2), our analysis of scrap prices and demand for scrap nationwide indicates that, within ranges dictated by the amounts of scrap on hand and the demand for steel, demand for scrap is a function of cyclical variations in the iron and steel industry as opposed to the price of scrap. As demand for steel increases, the demand for scrap increases and the price of scrap also increases. When demand for steel decreases, the demand for scrap and the price of scrap will also decrease.

If this analysis is correct, the freight rates on scrap iron and steel should logically have no effect on the total amount of scrap sold although it is without question that the freight rate structure can have a significant effect on where the scrap is sold and the location of scrap processors. If the analysis is less accurate, as some parties have suggested, it then becomes significant to note the relationship of transportation charges to the value of the commodity. In this way it can be established to what extent scrap iron and steel is transportation cost intensive. Prices of scrap iron and steel on a monthly basis have been presented in earlier sections. In this section we will compare past prices and projected 1975 prices with average rail freight rates.

Table 61 presents, *inter alia,* the total originated tons, gross revenues, and average revenue per gross ton for scrap iron and steel handled by rail in the United States between 1957 and 1973. While in a few of the years noted average revenue per ton has decreased, on the whole, revenue had increased from $4.70 per ton in 1957 to $6.48 in 1973. This increase, $1.78 per ton, is approximately 40 percent over the 16 years considered, or less than 2.5 percent per year.

TABLE 61

Statement of originated tons, gross freight revenue and average revenue per ton on iron ore and scrap iron and steel handled by rail in the United States
(1957-1973)

Year	Iron ore				Scrap iron and steel			
	Originated tons	Gross revenue	Average revenue per net ton	Average revenue per gross ton	Originated tons	Gross revenue	Average revenue per net ton	Average revenue per gross ton
1957	122,596,373	$268,161,854	$2.19	$2.45	25,280,918	$106,302,196	$4.20	$4.70
1958	77,131,743	184,355,910	2.39	2.68	16,623,322	74,749,757	4.50	5.04
1959	69,472,974	171,237,012	2.46	2.76	21,505,857	96,192,651	4.47	5.01
1960	96,846,698	226,904,321	2.34	2.62	21,304,909	87,596,699	4.11	4.60
1961	77,416,703	173,407,160	2.24	2.51	20,998,997	88,635,620	4.22	4.73
1962	79,036,271	180,751,059	2.29	2.56	18,911,602	77,785,219	4.11	4.60
1963	80,348,480	180,903,565	2.25	2.52	21,999,592	89,821,809	4.08	4.57
1964	96,690,586	217,992,296	2.25	2.52	24,618,173	102,217,018	4.15	4.65
1965	97,029,036	220,973,946	2.28	2.55	26,991,088	113,367,755	4.20	4.70
1966	107,334,638	234,108,647	2.18	2.44	27,395,912	114,954,443	4.20	4.70
1967	92,784,235	204,520,664	2.20	2.46	25,469,377	106,602,303	4.19	4.69
1968	94,096,123	211,132,542	2.24	2.51	26,716,415	115,250,558	4.31	4.83
1969	104,700,694	235,852,085	2.25	2.52	29,672,820	129,656,470	4.37	4.89
1970	104,208,467	241,507,773	2.32	2.60	28,183,281	136,404,346	4.84	5.42
1971	91,267,293	240,002,410	2.63	2.95	26,608,750	145,752,993	5.48	6.14
1972	90,149,935	244,039,543	2.71	3.04	28,488,197	157,305,295	5.52	6.18
(P)1973	102,441,587	299,519,000	2.92	3.27	33,472,084	193,681,000	5.79	6.48

(P)—Preliminary
Source: ICC Freight Commodity Statistics

Table 62 compares the average price of No. 1 heavy melting scrap with the average rail transporation charge for the entire country over the same time period. As can be noted in the final column, the ratio of rail transportation charges to the price of scrap has ranged between 10 percent and 18.6 percent between 1957 and 1973 and the most recent full year considered shows a ratio of 11.2 percent.

TABLE 62

*Comparison of the ratio of average rail transportation charge to delivered price on scrap iron and steel with iron ore**
(1957-1973)

Year	Iron ore value at mine	Average rail transportation charge	Iron ore delivered price	Ratio rail transportation charge to price	No. 1 heavy melting scrap (')	Average rail transportation charge	Ratio rail transportation charge to price
1957	$8.31	$2.45	$10.76	22.8	$47.10	$4.70	10.0
1958	8.59	2.68	11.27	23.8	37.81	5.04	13.3
1959	8.69	2.76	11.45	24.1	37.69	5.01	13.3
1960	8.73	2.62	11.35	23.1	33.20	4.60	13.9
1961	8.99	2.51	11.50	21.8	36.37	4.73	13.0
1962	8.84	2.56	11.40	22.5	28.34	4.60	16.2
1963	9.22	2.52	11.74	21.5	26.89	4.57	17.0
1964	9.52	2.52	12.04	20.9	36.50	4.65	12.7
1965	9.53	2.55	12.08	21.1	34.27	4.70	13.7
1966	9.49	2.44	11.93	20.5	30.66	4.70	15.3
1967	9.42	2.46	12.38	19.9	27.63	4.69	17.0
1968	10.21	2.51	12.72	19.7	25.94	4.83	18.6
1969	10.34	2.52	12.86	19.6	30.56	4.89	16.0
1970	10.80	2.60	13.40	19.4	41.25	5.42	13.1
1971	11.55	2.95	14.50	20.3	34.46	6.14	17.8
1972	12.20	3.04	15.24	19.9	36.63	6.18	16.9
1973	12.80(E)	3.27	16.07	20.3	57.67	6.48	11.2
3-15-74					118.50	6.88	5.8

*-In dollars and cents per gross ton
(') Composite averages at Pittsburgh, Philadelphia and Chicago
(E) Estimated
Source: American Metal Market, Metal Statistics, 1973, Minerals Yearbook and ICC Freight Commodity Statistics

Table 63 shows a similar comparison of price to freight rates, but shows an average for six railroads in the eastern territory, the territory in which the vast bulk of scrap iron and steel moves. These data indicate that between 1966 and 1973 the ratio of freight cost as a percentage of average scrap price ranged between 7.5 and 12.6. It is noteworthy that the lowest ratio occurred in the most recent year considered.

TABLE 63

Iron and Steel Scrap (STCC 40-211) comparison of railroad tonnages and revenue with steel production, scrap consumption and prices, 1966-1973 (B&O, B&LE, N&W, PC, Reading and EL)

Year	Number of cars (5)	Number of net tons (5)	Gross revenue (5)	Average revenue per ton (5)	Rate increases on scrap iron	U.S. Steel production (net tons) (thousands) (2)	U.S. scrap consumption (net tons) (thousands) (3)	Average price of scrap (4)	Freight cost as a percent of average scrap price
1966	388,988	18,498,791	$54,974,391	$2.97	None	134,101	91,583	$30.66	9.7
1967	310,346	17,041,431	44,962,371	2.64	10¢ per GT	127,213	85,361	27.63	9.6
1968	315,669	17,589,813	57,297,501	3.26	5%, max. 20¢ per GT	131,462	87,060	25.94	12.6
1969	335,419	18,953,715	62,604,897	3.30	6%	141,262	94,816	30.56	10.8
1970	301,022	16,886,540	60,469,067	3.58	6% and 8%	131,514	85,559	41.25	8.7
1971	287,776	16,358,571	66,555,419	4.07	11% (6)	120,443	82,817	34.46	11.8
1972	299,176	17,169,856	72,613,872	4.23	None	133,241	94,300	36.63	11.5
1973	351,421	20,281,754	87,925,737	4.34	4% and 1.9%	150,421	(1)101,493	57.67 (7)110.00	7.5 3.9

(1) Preliminary total as of March 21, 1974, as compiled by U.S. Bureau of Mines, Dept. of Interior.

(2) Source: AISI Annual Statistical Report—1972.

(3) Source: U.S. Bureau of Mines, Dept. of the Interior "Mineral Industry Surveys—Iron and Steel Scrap."

(4) Source: American Metal Market, composite price of No. 1 Heavy Melting Scrap at Philadelphia, Pittsburgh and Chicago compiled from monthly average prices.

(5) Source: Composite data of six Eastern railroads (B&O, B&LE, N&W, PC, Reading and EL).

(6) Includes 8 percent which initially became effective in 1970 (X-267-B).

(7) Source: American Metal Market, composite price of No. 1 Heavy Melting Scrap at Philadelphia, Pittsburgh and Chicago, as of May 1, 1974.

For purposes of projections for the near term, we have assumed that the the price of No. 1 heavy melting scrap, now at approximately $60 per gross ton delivered, will remain in the $50 to $90 range for 1976. Naturally, with a commodity whose price is as volatile as scrap prices have been, any prediction as to future prices is hazardous. However, current economic data available as well as the large price range chosen lend some safety to the prediction.

We have also selected $8.35 as the expected average freight revenue per gross ton nationwide this year.

Comparing the average freight rates expected with the range of scrap prices selected, table 64 has been developed to show the expected ratios of prices to freight rates for 1976.

TABLE 64

Comparison of expected 1976 scrap prices with expected 1976 scrap freight rates

Expected average scrap prices	*Expected average Nationwide rate*	*Ratio of price to Nationwide rate*
$50	$8.35	16.7
55	8.35	15.2
60	8.35	13.9
65	8.35	12.8
70	8.35	11.9
75	8.35	11.1
80	8.35	10.4
85	8.35	9.8
90	8.35	9.3

The picture developed by table 64 indicates that it is expected that the relationship of transportation costs to sales price for scrap iron and steel for 1976 will be 13.9 percent, assuming that the current sales price of $60 per ton will be the average price for the year. The ratio would be among the lowest of the ratios shown for any other full year in table 62. While this percentage is clearly significant, the comparable ratio for iron ores for 1973 was 26.2 percent. Thus, it seems clear that the higher value commodity, scrap iron and steel, is significantly less rail freight rate intensive to the consumer than the lower value commodity, iron ores.

Part (1)(D)(2): Rate structure by territories

Due to the large numbers of scale rates and point-to-point commodity rates currently applicable on movements of iron and steel scrap, it is clearly beyond the scope of this proceeding to give complete rate histories for all of the considered movements. However, it is considered important to at least present a brief history of the development of the scale rates in the several territories, the basic rationale for many of the point-to-point commodity rates, and the effect of the general freight rate increases.

While most of the tables presented are updated only to the point of the closing of evidence in this proceeding, table 65 sets out the results of ex parte increases on scrap iron and steel between Ex Parte No. 223-A and Ex Parte No. 310.

TABLE 65

Rate changes for scrap iron and steel (1960 to present)

Ex Parte	Date effective	Rate change approved
223-A	September 1, 1962	1/2 cent hundredweight[1]
Do	do	1 cent hundredweight[2]
Do	do	10 cent net ton[3]
Do	do	11 cent gross ton[3]
Do	do	20 cent net ton[4]
Do	do	22 cent gross ton[4]
256	August 19, 1967	(5)
Do	March 18, 1968	10 cents per ton[6]
259-B	November 28, 1968	3 percent
Do	January 30, 1969	5 percent[7]
262	November 18, 1969	6 percent
265-B	November 20, 1970	6 percent
267-B	April 12, 1971	11 percent[8]
281-B	October 23, 1972	No increase.
Do	Aughts 13, 1973	3 percent[9]
295-A	August 19, 1973	No increase[10]
295 (Sub-No. 1)	November 15, 1974	3 percent maximum 22 cents per gross ton
299-A	March 16, 1974	2.8 percent surcharge subject to exceptions[8]
303-A	March 9, 1974	4 percent increase subject to exceptions
305-A	June 20, 1974	3.3 percent
310	May 5, 1975	7 percent subject to holddown[11]

---

[1] Rates not exceeding 65 cents hundredweight.

[2] Rates exceeding 65 cents hundredweight.

[3] Rates not exceeding $13 per ton, net or gross, as rated.

[4] Rates exceeding $13 per ton, net or gross, as rated.

[5] (i) Rates published in cents per 100 pounds:

	Per hundredweight
Rates not exceeding 10 cents	1/2 cents
Rates over 10 cents but not exceeding 30 cents	1 cent
Rates over 30 cents but not exceeding 80 cents	2 cents
Rates over 80 cents	3 cents

Rate changes for scrap iron and steel (1960 to present)—Continued

(ii) Rates published in cents per ton (net or gross as rated):

	Per ton
Rates not exceeding 200 cents	10 cents
Rates over 200 cents but not exceeding 600 cents	20 cents
Rates over 600 cents but not exceeding 1600 cents	40 cents
Rates over 1600 cents	60 cents

Except between points in the South:
In cents per 100 pounds:

1/2 cent on rates not exceeding 25 cents.
1 cent on rates over 25 cents.

In cents per ton, net or gross, as rated:

10 cents on rates not over 500 cents
20 cents on rates over 500 cents

[6] Net or gross as rated.

[7] Maximum 20 cents per ton, net or gross as rated.

[8] Except 6 percent between stations in southern territory, from points in eastern territory to points in southern territory, also from points in western territory to points in southern territory.

[9] 3 percent on scrap iron for recycling.

[10] Where applicable all-rail-line-haul carload rates are in amounts per car, and transportation charges are not based on the weight for the purpose of determining maximum increases named herein will be deemed to be 134,000 pounds (60 gross tons) on iron ore (not ground or hydrated) or iron sinter or commodities rated as such.

[11] The increase on iron and steel scrap was limited to the increase in cents per ton on iron ores.

As previously noted, the vast majority of involved movements originate in official territory. Prior to 1929 the railroads had a system of origin and destination groupings under which rates were set in order to maintain competitive balances among products. The groups were quite large, often encompassing more than whole States and, therefore, were not closely related to distance. After Commission action in 1929 and following years, a maximum mileage scale of rates was set at 70 percent of the rates on finished steel products, minimum 40,000 pounds. Actually, between 1929 and 1954 most official territory iron and steel scrap moved at a level equal to 27.5 percent of first class with minimums ranging between 44,800 and 56,000 pounds. During this same period, most central territory traffic moved at rates reflecting the rates for iron and steel billets which were set at 70 percent of iron and steel rates or 85 percent of sixth-class rates. Trunkline territory rates were set at 70 percent of the rates on finished iron and steel products plus 3 cents. It should be noted that during this period selected rates on finished iron and steel products were being reduced to meet intermodal competition from trucks.

In 1954 a lower level of rates, 87 percent of existing rates, was established on movements, a minimum of 80,000 pounds. A further reduction was made in the early 1960's for movements of 112,000 pounds minimum. These rates were equal to 85 percent of the existing 80,000-pound rates at distances of 320 to 400 miles. For each 100 miles between 400 and 1,200 miles, an additional 1-percent reduction was made and from 125 to 320 miles, lesser reductions were made. Rates were not changed for movements under 125 miles. Additional reductions were made on point-to-point commodity rates to meet truck competition and to encourage longer hauls. Further reduced rates have been published at higher minimum weights and at minimum volumes for multiple-car movements. Separate North to South rates, minimum 50,000 and 80,000, at class 21 and 18 have been canceled and the above-noted scales apply on these movements.

Table 66 reflects the history of ex parte increases as sought by eastern carriers and approved by the Commission between Ex Parte No. 256 and Ex Parte No. 295-A. Differences between tables 65 and 66 may be accounted for by the timelag between presentation of the table by the eastern carriers and completion of this report.

TABLE 66

Rate changes for scrap iron and steel in official territory (1966 to present)

Ex Parte No.	Date effective	Rate change	
		Sought	Approved
256	August 19, 1967	(1)	(1)
Do	March 18, 1968		10 cents per ton[1]
259-B	November 28, 1968	(6)	3 percent
Do	January 30, 1969		5 percent[1]
262	November 18, 1969	6 percent	6 percent
265-B	November 20, 1970	6 percent	6 percent
267-B	April 12, 1971	15 percent	11 percent[1]
281-B	October 23, 1972	4 percent	No increase
Do	August 13, 1973		4 percent[1]
295-A	August 19, 1973	3 percent	No increase
295[1]	November 15, 1974	3 percent	3 percent[1]
303			
305			

[1]Rates published in cents per 100 pounds:

Rate changes for scrap iron and steel in official territory (1966 to present)—Continued

	Per hundredweight
Rates not exceeding 10 cents	1/2 cent
Rates over 10 cents but not exceeding 30 cents	1 cent
Rates over 30 cents but not exceeding 80 cents	2 cents
Rates over 80 cents	3 cents

[2] Net or gross as rated.

[3] Maximum 20 cents per ton, net or gross as rated.

[4] Except 6 percent between stations in southern territory, from points in eastern territory to points in southern territory, also from points in western territory to points in southern territory.

[5] 3 percent on scrap iron for recycling.

[6] 25 cents per ton, net or gross as rated on rates not exceeding $8 per ton, net or gross as rated, and 5 percent per ton, net or gross as rated on rates exceeding $8 per ton net or gross as rated.

[7] Not to exceed maximum of 22 cents.

Interterritorial rate scales between southern origins and points in official territory (mostly Ohio and Pennsylvania) have fluctuated within limited ranges since the early 1930's. As scale rate cases were often brought to the Commission involving only a limited number of origin and destination points on individual railroads, time differences are often found in the parties' statements of rate changes. In general it appears that prior to 1932 rates to the southern Ohio group were set at class II or 20 percent of first class. Later Commission decisions in the 1930's authorized rates at 40,000- and 50,000-pound minima ranging between 15 percent of first class and 15 percent plus 10 cents. A 1948 decision authorized rates on a minimum weight of 50,000 pounds as high as 17 percent of first class. Later changes of significance include the 1959 reduction of 50,000- and 80,000-pound rates to class 21 and class 18 and the 1965 reduction of 112,000-pound rates to Commodity Rate Column 1131. Naturally, numerous point-to-point commodity rates at higher minima have been published at lower levels in order to meet competition.

Table 67 includes a history of ex parte increases from, to, and within Southern Freight Association Territory. Figure 18 has been presented in order to clarify the distinctions between the various rate levels from the South to official territory.

TABLE 67

History of ex parte increases on scrap iron from, to, and within SFA territory

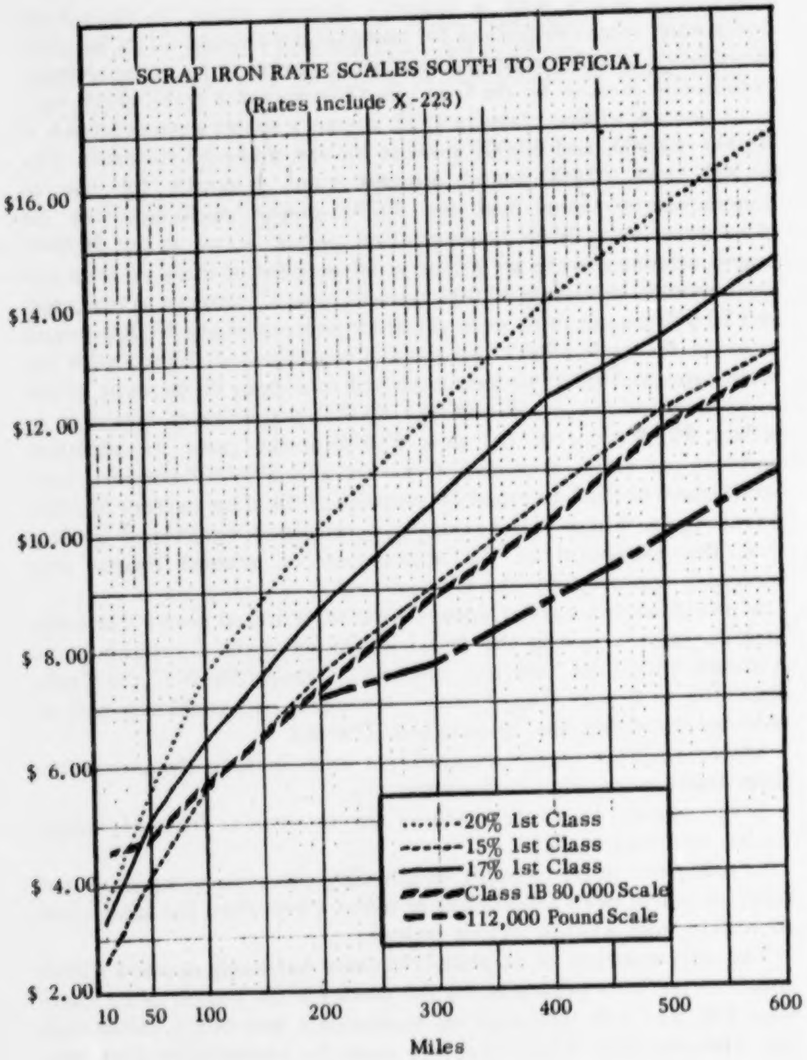
Ex Parte Tariff No.	Effective date	Sought	Authorized	Applied	Authority
X-256 (Interim)	Aug. 19, 1967	10¢ NT or GT	10¢ NT or GT	10¢ NT or GT	329 ICC 896
X-256 (Final)	Mar. 18, 1968	do	do	do	332 ICC 331
X-259	May 27, 1968	25¢ NT or GT rates under $8.00-over $8.00-5%.	Tariff never became effective. Canceled by X-259-A.		
X-259-A (Interim)	June 24, 1968	do	3%	3%	332 ICC 590
X-259-B (Interim)	Nov. 28, 1968	do	3%	3%	332 ICC 590
X-259-B (Final)	Jan. 30, 1969	do	5% max. 20¢ NT or GT	5% max. 20¢ NT or GT	332 ICC 714
X-262	Nov. 18, 1969	6%	6%	6%	337 ICC 474
X-265	June 2, 1970	6%	Tariff never became effective. Canceled by X-265-A.		
X-265-A (Interim)	June 9, 1970	T-6%, W-0%, F-0%	5% max. 24¢ NT or GT	5% max. 24¢ NT or GT	Order May 27, 1970
X-265-B (Interim)	Nov. 20, 1970	6%	6%	6%	Order Nov. 4, 1970
X-265-B (Final)	April 12, 1971	6%	6%	6%	339 ICC 125
X-267	Nov. 18, 1970	6%	Tariff never became effective. Canceled by X-267-A.		
X-267-A (Interim)	Nov. 20, 1970	6%	6%	6%	339 ICC 209
X-267-B (Interim)	April 12, 1971	W, T-6%, F-11%	11%	W, T-6%, F-11%	339 ICC 209
X-267-B (Final)	Nov. 10, 1971	W, T-6%, F-11%	11%	W, T-6%, F-11%	339 ICC 258
X-281	Feb. 5, 1972	2 1/2% surcharge	2 1/2% surcharge	2 1/2% surcharge	340 ICC 358
X-281-A (Interim)	May 1, 1972	SE-4%, SW-5%, W, EWS-3%, min. 15¢ NT	Tariff never became effective. Canceled by X-281-B.		341 ICC 392
X-281-B (Final)	Aug. 13, 1973	do	SE-4%, SW-5%, W, EWS-3% min. 15¢ NT	SE-4%, SW-5%, W, EWS-3%	341 ICC 413
X-295	July 29, 1973	5%	Tariff never became effective. Canceled by X-295-A.		
X-295-A (Final)	Aug. 19, 1973	3%	(1)	(1)	344 ICC 598

NT - Per ton of 2,000 pounds
GT - Per ton of 2,240 pounds
W - Within SFA
T - To SFA

SE - SFA to East
SW - SFA to West
EWS - East and West to SFA
F - From SFA

(1) - Increase of 3% suspended in Supplement 21 to Ex Parte Tariff 295-A until November 10, 1974.

FIGURE 18


SCRAP IRON RATE SCALES SOUTH TO OFFICIAL
(Rates include X-223)
$16.00
$14.00
$12.00
$10.00
$ 8.00
$ 6.00
$ 4.00
$ 2.00
10
50
100
200
300
400
500
600
Miles
-20% 1st Class
-15% 1st Class
-17% 1st Class
Class 1B 80,000 Scale
112,000 Pound Scale

Within southern territory, information presented by the parties indicates that the majority of scrap movements are under distance commodity scales with a minority moving under point-to-point commodity rates established for competitive reasons. Prior to 1932, movements of scrap iron and steel were governed by point-to-point commodity rates or by the Georgia-Alabama scale rates which were at 15 percent of first class. In 1932, distance scales were approved at 40,000, 50,000, and 80,000 pounds for the involved railroads. The 40,000- and 50,000-pound minima were generally for use to concentration points and the 80,000-pound minimum was for movements away from concentration points. Rates at the 50,000-pound minimum were set either at 60 percent of rates on iron and steel articles, minimum 40,000 pounds, or at 15 percent of first class and 80,000-pound rates were set at 80 percent of the 50,000-pound rates. In the early 1960's this pattern was adjusted slightly with the scale rates at 50,000 pounds modified to reflect 90 percent of the truck competitive scale and the 80,000-pound rates adjusted to reflect 80 percent of the new 50,000-pound rates. In addition, multiple-car rates, minimum five cars and 500,000 pounds, were established in 1962 to equal 80 percent of the then-current 80,000-pound scale. These rate scales have remained unchanged to date with the exception of the application of general freight rate increases approved by the Commission.

Motor common carrier competitive rates noted above currently include rates covering the following movements: Chattanooga to Alabama City, Charlotte to Croft, N.C., Statesville, N.C., to Croft, Nashville to Emory Gap, Tenn., Alexandria to Lynchburg, and all movements within the Birmingham District.

Motor contract carrier competitive rates include the movement from Owensboro, Ky., to Steelton, Ky.

Barge competitive rates include the movement from Memphis, Tenn., to Newport, Ky.

In addition, point-to-point commodity rates on scrap iron and steel have also been established at lower levels than the scale rates to reflect competition among producers.

The only example of ex parte increases not being applied within southern territory presented by the parties is the waiver of Ex Parte Nos. 256 and 259 increases on movements between Chattanooga and Alabama City. The waiver was made for competitive purposes.

Tables 68, 69, and 70 present the rate scales within southern territory for minimum weights 50,000, 80,000, and 500,000 pounds. As noted above, these tables, presented by the parties, are updated only through increases allowed in Ex Parte No. 281. Figure 19 compares the rate scales at the Ex Parte No. 223 level with the 80,000-pound rates available in 1932, and figure 20 presents a comparison of the Ex Parte No. 281 scale rates and various point-to-point commodity rates presented as representative movements.

345 I.C.C.

TABLE 68

STATEMENT SHOWING SCRAP IRON RATES, MINIMUM WEIGHT 50,000 POUNDS, APPLICABLE WITHIN SFA TERRITORY, IN EFFECT SINCE 1932 TO PRESENT.

(Rates in cents per ton of 2000 lbs.)

28300 Miles	Base Rate as Published	X-123 (1)	X-162 (2)	X-166 (3)	X-168 (4)	X-175 (5)	X-196 (6)	X-206 (7)	X-212 (8)	Rates Reduced	X-223 (9)	X-256 (10)	X-259 (11)	X-262 (12)	X-265 (13)	X-267 (14)	X-281 (15)	X-295 (16)
10	80	88	106	133	146	168	178	194	200	216	226	236	248	263	279	296	305	
25	110	121	145	181	199	229	243	265	273	252	262	272	286	303	321	340	350	
50	140	154	185	231	254	292	310	338	348	300	310	320	336	356	377	400	412	
75	170	187	224	280	308	354	375	409	421	378	388	398	418	443	470	498	513	
100	190	209	251	314	345	397	421	459	473	432	442	452	472	500	530	562	579	
125	220	242	290	363	399	459	487	531	547	486	496	506	526	558	591	626	645	
150	235	259	311	389	428	492	522	569	586	522	532	542	562	596	632	670	690	
175	250	275	330	413	454	522	553	603	621	558	568	578	598	634	672	712	733	
200	265	292	350	438	482	554	587	640	659	594	604	614	634	672	712	755	778	
225	295	325	390	488	537	618	655	714	735	666	676	686	706	748	793	841	866	
250	310	341	409	511	562	646	685	747	769	702	712	722	742	787	834	884	911	
275	325	358	430	538	592	681	722	787	811	756	766	776	796	844	895	949	977	
300	340	374	449	561	617	710	753	821	846	810	820	830	850	901	955	1012	1042	
325	370	407	488	610	671	772	818	892	919	828	838	848	868	920	975	1034	1065	
350	385	424	509	636	700	805	853	930	958	882	892	902	922	977	1036	1098	1131	
375	400	440	528	660	726	835	885	965	994	954	964	974	994	1054	1117	1184	1220	
400	415	457	548	685	754	867	919	1002	1032	972	982	992	1012	1073	1137	1205	1241	
425	445	490	588	735	809	930	986	1075	1107	1026	1036	1046	1066	1130	1198	1270	1308	
450	460	506	607	759	835	960	1018	1110	1143	1080	1090	1100	1120	1187	1258	1333	1373	
475	475	523	628	785	864	994	1054	1149	1183	1116	1126	1136	1156	1225	1299	1377	1418	
500	490	539	647	809	890	1024	1085	1183	1218	1188	1198	1208	1228	1302	1380	1463	1507	
525	520	572	686	858	944	1086	1151	1255	1293	1260	1270	1280	1300	1378	1461	1549	1595	
550	535	589	707	884	972	1118	1185	1292	1331	1296	1306	1316	1336	1416	1501	1591	1639	
575	550	605	726	908	999	1149	1218	1328	1368	1332	1352	1362	1386	1469	1557	1650	1700	
600	565	622	746	933	1026	1180	1251	1364	1404	1350	1370	1380	1400	1484	1573	1667	1717	
625	595	655	786	983	1081	1243	1318	1437	1477	1404	1424	1434	1454	1541	1633	1731	1783	
650	610	671	805	1006	1107	1273	1349	1470	1510	1440	1460	1470	1490	1579	1674	1774	1827	
675	625	688	826	1033	1136	1306	1384	1509	1549	1458	1478	1488	1508	1598	1694	1796	1850	
700	640	704	845	1056	1162	1336	1416	1543	1583	1494	1514	1524	1544	1637	1735	1839	1894	
725	670	737	884	1105	1216	1398	1482	1615	1655	1548	1568	1578	1598	1694	1796	1904	1961	

TABLE 68 (cont.)

28300 Miles	Base Rate as Published	X-123 (1)	X-162 (2)	X-166 (3)	X-168 (4)	X-175 (5)	X-196 (6)	X-206 (7)	X-212 (8)	Rates Reduced	X-223 (9)	X-256 (10)	X-259 (11)	X-262 (12)	X-265 (13)	X-267 (14)	X-281 (15)	X-295 (16)
750	685	754	905	1131	1244	1431	1517	1654	1694	1566	1586	1596	1616	1713	1816	1925	1983	
775	700	770	924	1155	1271	1462	1550	1690	1730	1602	1622	1632	1652	1751	1856	1967	2026	
800	715	787	944	1180	1298	1493	1583	1725	1765	1620	1640	1650	1670	1770	1876	1989	2049	
825	745	820	984	1230	1353	1556	1646	1794	1834	1674	1694	1704	1724	1827	1937	2053	2115	
850	760	836	1003	1254	1379	1586	1681	1832	1872	1710	1730	1740	1760	1866	1978	2097	2160	
875	775	853	1024	1280	1408	1619	1716	1870	1910	1746	1766	1776	1796	1904	2018	2139	2203	
900	790	869	1043	1304	1434	1649	1748	1905	1945	1764	1784	1794	1814	1923	2038	2160	2225	
925	820	902	1082	1353	1488	1711	1814	1977	2017	1800	1820	1830	1850	1961	2079	2204	2270	
950	835	919	1103	1379	1517	1745	1850	2017	2057	1818	1838	1848	1868	1980	2099	2225	2292	
975	850	935	1122	1403	1543	1774	1880	2049	2089	1890	1910	1920	1940	2056	2179	2310	2379	
1000	865	952	1142	1428	1571	1807	1915	2087	2127	1926	1946	1956	1976	2095	2221	2354	2425	
1025	895	985	1182	1478	1626	1870	1982	2160	2200	1962	1982	1992	2012	2133	2261	2397	2469	
1050	910	1001	1201	1501	1651	1899	2013	2194	2234	1998	2018	2028	2048	2171	2301	2439	2512	
1075	925	1018	1218	1523	1675	1926	2042	2226	2266	2034	2054	2064	2084	2209	2342	2483	2557	
1100	940	1034	1234	1543	1697	1952	2069	2255	2295	2034	2054	2064	2084	2209	2342	2483	2557	
1125	970	1067	1267	1584	1742	2003	2123	2314	2354	2070	2090	2100	2120	2247	2382	2525	2600	
1150	985	1084	1284	1604	1764	2029	2151	2345	2385	2106	2126	2136	2156	2285	2422	2567	2644	
1175	1000	1100	1300	1620	1782	2049	2172	2367	2407	2124	2144	2154	2174	2304	2442	2589	2667	
1200	1015	1117	1317	1637	1801	2071	2195	2393	2433	2160	2180	2190	2210	2343	2484	2633	2712	
1225	1045	1150	1350	1670	1837	2113	2240	2442	2482	2178	2198	2208	2228	2362	2504	2654	2734	
1250	1060	1166	1366	1686	1855	2133	2261	2464	2504	2196	2216	2226	2246	2381	2524	2675	2755	
1275	1075	1183	1383	1703	1873	2154	2283	2488	2528	2214	2234	2244	2264	2400	2544	2697	2778	
1300	1090	1199	1399	1719	1891	2175	2306	2514	2554	2232	2252	2262	2281	2418	2566	2717	2799	
1325	1120	1232	1432	1752	1927	2216	2349	2560	2600	2250	2270	2280	2300	2438	2584	2739	2821	
1350	1135	1249	1449	1769	1946	2238	2372	2585	2625	2250	2270	2280	2300	2438	2584	2739	2821	
1375	1150	1265	1465	1785	1964	2259	2395	2611	2651	2286	2306	2316	2336	2476	2625	2782	2865	
1400	1165	1282	1482	1802	1982	2279	2416	2633	2673	2304	2324	2334	2354	2495	2645	2804	2888	
1425	1195	1315	1515	1835	2019	2322	2461	2682	2722	2322	2342	2352	2372	2514	2665	2825	2910	
1450	1210	1331	1531	1851	2036	2341	2481	2704	2744	2340	2360	2370	2390	2533	2685	2847	2932	
1475	1225	1348	1548	1868	2055	2363	2505	2730	2770	2373	2393	2403	2423	2568	2722	2886	2973	
1500	1240	1364	1564	1884	2072	2383	2526	2753	2793	2394	2404	2414	2434	2580	2735	2899	2986	

TABLE 68 (cont.)

Explanation of reference marks

[1] 10%
[2] 20% maximum 200 cents NT.
[3] 25% maximum 320 cents NT.
[4] 10%
[5] 15%
[6] 6%
[7] 9%
[8] 3% maximum 40 cents NT.
[9] 10 cents NT on rates under 1300 cents NT and 20 cents NT on rates over 1300 cents NT.
[10] 10 cents NT.
[11] 5% maximum 20 cents NT.
[12] 6%
[13] 6%
[14] 6%
[15] 3%
[16] No increase applicable. Three percent sought, however, Supplement 21 to Tariff of Increased Rates and Charges X-295-A suspended the increase on scrap iron until November 10, 1974.
NT Per ton of 2,000 pounds.

TABLE 69

STATEMENT SHOWING SCRAP IRON RATES, MINIMUM WEIGHT 80,000 POUNDS,
APPLICABLE WITHIN SFA TERRITORY, IN EFFECT SINCE 1932 TO PRESENT.

(Rates in cents per ton of 2000 lbs.)

28300 Miles	Base Rate as Published	X-123 (1)	X-162 (2)	X-166 (3)	X-168 (4)	X-175 (5)	X-196 (6)	X-206 (7)	X-212 (8)	Rates Reduced	X-223 (9)	X-256 (10)	X-259 (11)	X-262 (12)	X-265 (13)	X-267 (14)	X-281 (15)	X-295 (16)
10	65	72	86	108	119	137	145	158	163	173	183	193	203	215	228	242	249	
25	90	99	119	149	164	189	200	218	225	202	212	222	233	247	262	278	286	
50	110	121	145	181	199	229	243	265	273	240	290	260	273	289	306	324	334	
75	135	149	179	224	246	283	300	327	337	302	312	322	338	358	379	402	414	
100	150	165	198	248	273	314	333	363	374	346	356	366	384	407	431	457	471	
125	175	193	232	290	319	367	389	424	437	389	399	409	429	455	482	511	526	
150	190	209	251	314	345	397	421	459	473	418	428	438	458	485	514	545	561	
175	200	220	264	330	363	417	442	482	496	446	456	466	486	515	546	579	596	
200	210	231	277	346	381	438	464	506	521	475	485	495	515	546	579	614	632	
225	235	259	311	389	428	492	522	569	586	533	543	553	573	607	643	682	702	
250	250	275	330	413	454	522	553	603	621	562	572	582	602	638	676	717	739	
275	260	286	343	429	472	543	576	628	647	605	615	625	645	684	725	769	792	
300	270	297	356	445	490	564	598	652	672	648	658	668	688	729	773	812	836	
325	295	325	390	488	537	618	655	714	735	662	672	682	702	744	789	836	861	
350	310	341	409	511	562	646	685	747	769	706	716	726	746	791	838	888	915	
375	320	352	422	528	581	668	708	772	795	763	773	783	803	851	902	956	985	
400	330	363	436	545	600	690	731	797	821	778	788	798	818	867	919	974	1003	
425	355	391	469	586	645	742	787	858	884	821	831	841	861	913	968	1026	1057	
450	370	407	488	610	671	772	818	892	919	864	874	884	904	958	1015	1076	1108	
475	380	418	502	628	691	795	843	919	947	893	903	913	933	989	1048	1111	1144	
500	390	429	515	644	708	814	863	941	969	950	960	970	990	1049	1112	1179	1214	
525	415	457	548	685	754	867	919	1002	1032	1008	1018	1028	1048	1111	1178	1249	1286	
550	430	473	568	710	781	898	952	1038	1069	1037	1047	1057	1077	1142	1211	1284	1323	
575	440	484	581	727	800	920	975	1063	1095	1066	1076	1086	1106	1172	1242	1317	1357	
600	450	495	594	743	817	940	996	1086	1119	1080	1090	1100	1120	1187	1258	1333	1373	
625	475	523	628	785	864	994	1054	1149	1183	1123	1133	1143	1163	1233	1307	1385	1427	
650	490	539	647	809	890	1024	1085	1183	1218	1152	1162	1172	1192	1264	1340	1420	1463	
675	500	550	660	825	908	1044	1107	1207	1243	1166	1176	1186	1206	1278	1355	1436	1479	
700	510	561	673	842	926	1065	1129	1231	1268	1195	1205	1215	1235	1309	1388	1471	1515	
725	535	589	707	884	972	1113	1185	1292	1331	1238	1248	1258	1278	1355	1436	1522	1568	

TABLE 69 (cont.)

28300 Miles	Base Rate as Published	X-123 (1)	X-162 (2)	X-166 (3)	X-168 (4)	X-175 (5)	X-196 (6)	X-206 (7)	X-212 (8)	Rates Reduced	X-223 (9)	X-256 (10)	X-259 (11)	X-262 (12)	X-265 (13)	X-267 (14)	X-281 (15)	X-295 (16)
750	550	605	726	908	999.	1149	1218	1328	1368	1253	1263	1273	1293	1371	1453	1540	1586	
775	560	616	739	924	1016	1168	1238	1349	1389	1282	1292	1302	1322	1401	1485	1574	1621	
800	570	627	752	940	1034	1189	1260	1373	1413	1296	1306	1316	1336	1416	1501	1591	1639	
825	595	655	786	983	1081	1243	1318	1437	1477	1339	1359	1369	1389	1472	1560	1654	1704	
850	610	671	805	1006	1107	1273	1349	1470	1510	1368	1388	1398	1418	1503	1593	1689	1740	
875	620	682	818	1023	1125	1294	1372	1495	1535	1397	1417	1427	1447	1534	1626	1724	1776	
900	630	693	832	1040	1144	1316	1395	1521	1561	1411	1431	1441	1461	1549	1642	1741	1793	
925	655	721	865	1081	1189	1367	1449	1579	1619	1440	1460	1470	1490	1579	1674	1774	1827	
950	670	737	884	1105	1216	1398	1482	1615	1655	1454	1474	1484	1504	1594	1690	1791	1845	
975	680	748	898	1123	1235	1420	1505	1640	1680	1512	1532	1542	1562	1656	1755	1860	1916	
1000	690	759	911	1139	1253	1441	1527	1664	1704	1541	1561	1571	1591	1686	1787	1894	1951	
1025	715	787	944	1180	1298	1493	1583	1725	1765	1570	1590	1600	1620	1717	1820	1929	1987	
1050	730	803	964	1205	1326	1525	1617	1763	1803	1598	1618	1628	1648	1747	1852	1963	2022	
1075	740	814	977	1221	1343	1544	1637	1784	1824	1627	1647	1657	1677	1778	1885	1998	2058	
1100	750	825	990	1238	1362	1566	1660	1809	1849	1627	1647	1657	1677	1778	1885	1998	2058	
1125	775	853	1024	1280	1408	1619	1716	1870	1910	1656	1676	1696	1716	1819	1928	2044	2105	
1150	790	869	1043	1304	1434	1649	1748	1905	1945	1685	1705	1715	1735	1839	1949	2066	2128	
1175	800	880	1056	1320	1452	1670	1770	1929	1969	1699	1719	1729	1759	1865	1977	2096	2159	
1200	810	891	1069	1336	1470	1691	1792	1953	1993	1728	1748	1758	1778	1885	1998	2118	2182	
1225	835	919	1103	1379	1517	1745	1850	2017	2057	1742	1762	1772	1792	1900	2014	2135	2199	
1250	850	935	1122	1403	1543	1774	1880	2049	2089	1757	1777	1787	1807	1915	2030	2152	2217	
1275	860	946	1135	1419	1561	1795	1903	2074	2114	1771	1791	1801	1821	1930	2046	2169	2234	
1300	870	957	1148	1435	1579	1816	1925	2098	2138	1786	1806	1816	1836	1946	2063	2187	2253	
1325	895	985	1182	1478	1626	1870	1982	2160	2200	1800	1820	1830	1850	1961	2079	2204	2273	
1350	910	1001	1201	1501	1651	1899	2013	2194	2234	1800	1820	1830	1850	1961	2079	2204	2273	
1375	920	1012	1212	1515	1667	1917	2032	2215	2255	1829	1849	1859	1879	1992	2112	2239	2306	
1400	930	1023	1223	1529	1682	1934	2050	2235	2275	1843	1863	1873	1893	2007	2127	2255	2323	
1425	955	1051	1251	1564	1720	1978	2097	2286	2326	1858	1878	1888	1908	2022	2143	2272	2340	
1450	970	1067	1267	1584	1742	2003	2123	2314	2354	1872	1892	1902	1922	2037	2159	2289	2358	
1475	980	1078	1278	1598	1758	2022	2143	2336	2376	1901	1921	1931	1951	2068	2192	2324	2394	
1500	990	1089	1289	1609	1770	2036	2158	2352	2392	1915	1935	1945	1965	2083	2208	2340	2410	

TABLE 69 (cont.)

Explanation of reference marks

[1] 10%
[2] 20% maximum 200 cents NT.
[3] 25% maximum 320 cents NT.
[4] 10%
[5] 15%
[6] 6%
[7] 9%
[8] 3% maximum 40 cents NT.
[9] 10 cents NT on rates under 1300 cents NT and 20 cents NT on rates over 1300 cents NT.
[10] 10 cents NT.
[11] 5% maximum 20 cents NT.
[12] 6%
[13] 6%
[14] 6%
[15] 3%
[16] No increase applicable. Three percent sought, however, Supplement 21 to Tariff of Increased Rates and Charges X-295-A suspended the increase on scrap iron until November 10, 1974.
NT Per ton of 2,000 pounds.

TABLE 70

Statement showing scrap iron rates in 5-car lots, minimum weight 500,000 pounds, applicable within SFA territory, in effect since 1962 to present

28,300 miles	Base rate as published	X-256 (1)	X-259 (2)	X-262 (3)	X-265 (4)	X-267 (5)	X-281 (6)	X-295 (7)
(Rates in cents per ton of 2,000 pounds)								
10	146	156	164	174	184	195	201	--------
25	170	180	189	200	212	225	232	--------
50	200	210	221	234	248	263	271	--------
75	242	252	265	281	298	316	325	--------
100	285	295	310	329	349	370	381	--------
125	319	329	345	366	388	411	423	--------
150	342	352	370	392	416	441	454	--------
175	365	375	394	418	443	470	484	--------
200	388	398	418	443	470	498	513	--------
225	434	444	464	492	522	553	570	--------
250	458	468	488	517	548	581	598	--------
275	492	502	522	553	586	621	640	--------
300	526	536	556	589	624	661	681	--------
325	538	548	568	602	638	676	696	--------
350	573	583	603	639	677	718	740	--------
375	618	628	648	687	728	772	795	--------
400	630	640	660	700	742	787	811	--------
425	665	675	695	737	781	828	853	--------
450	699	709	729	773	819	868	894	--------
475	722	732	752	797	845	896	923	--------

Statement showing scrap iron rates in 5-car lots, minimum weight 500,000 pounds, applicable within SFA territory, in effect since 1962 to present—Continued

28,300 miles	Base rate as published	X-256 (1)	X-259 (2)	X-262 (3)	X-265 (4)	X-267 (5)	X-281 (6)	X-295 (7)
(Rates in cents per ton of 2,000 pounds)								
500	768	778	798	846	897	951	980	--------
525	814	824	844	895	949	1,006	1,036	--------
550	838	848	868	920	975	1,034	1,065	--------
575	861	871	891	944	1,001	1,061	1,093	--------
600	872	882	902	956	1,013	1,074	1,106	--------
625	906	916	936	992	1,052	1,115	1,148	--------
650	930	940	960	1,018	1,079	1,144	1,178	--------
675	941	951	971	1,029	1,091	1,156	1,191	--------
700	964	974	994	1,054	1,117	1,184	1,220	--------
725	998	1,008	1,028	1,090	1,155	1,224	1,261	--------
750	1,010	1,020	1,040	1,102	1,168	1,238	1,275	--------
775	1,034	1,044	1,064	1,128	1,196	1,268	1,306	--------
800	1,045	1,055	1,075	1,140	1,208	1,280	1,318	--------
825	1,087	1,097	1,117	1,184	1,255	1,330	1,370	--------
850	1,110	1,120	1,140	1,208	1,280	1,357	1,398	--------
875	1,135	1,144	1,164	1,234	1,308	1,386	1,428	--------
900	1,145	1,155	1,175	1,246	1,321	1,400	1,442	--------
925	1,168	1,178	1,198	1,270	1,346	1,427	1,470	--------
950	1,179	1,189	1,209	1,282	1,359	1,441	1,484	--------
975	1,226	1,236	1,256	1,331	1,411	1,496	1,541	--------
1,000	1,249	1,259	1,279	1,356	1,437	1,523	1,569	--------
1,025	1,272	1,282	1,302	1,380	1,463	1,551	1,598	--------
1,050	1,294	1,304	1,324	1,403	1,487	1,576	1,623	--------
1,125	1,341	1,351	1,371	1,453	1,540	1,632	1,681	--------
1,150	1,364	1,374	1,394	1,478	1,567	1,661	1,711	--------
1,175	1,375	1,385	1,405	1,489	1,478	1,678	1,723	--------
1,200	1,398	1,408	1,428	1,514	1,605	1,701	1,752	--------
1,225	1,410	1,420	1,440	1,526	1,618	1,715	1,766	--------
1,250	1,422	1,432	1,452	1,539	1,631	1,729	1,781	--------
1,275	1,433	1,443	1,463	1,551	1,644	1,743	1,795	--------
1,300	1,445	1,455	1,475	1,564	1,658	1,757	1,810	--------
1,325	1,456	1,466	1,486	1,575	1,670	1,770	1,823	--------
1,350	1,456	1,466	1,486	1,575	1,670	1,770	1,823	--------
1,375	1,479	1,489	1,509	1,600	1,696	1,798	1,852	--------
1,400	1,490	1,500	1,520	1,611	1,708	1,810	1,864	--------
1,425	1,502	1,512	1,532	1,624	1,721	1,824	1,879	--------
1,450	1,514	1,524	1,544	1,637	1,735	1,839	1,894	--------
1,475	1,537	1,547	1,567	1,661	1,761	1,867	1,923	--------
1,500	1,540	1,550	1,570	1,664	1,764	1,870	1,926	--------

Explanation of reference marks

[1] 10 cents NT.

[2] 5% maximum 20 cents NT.

[3] 6%

[4] 6%

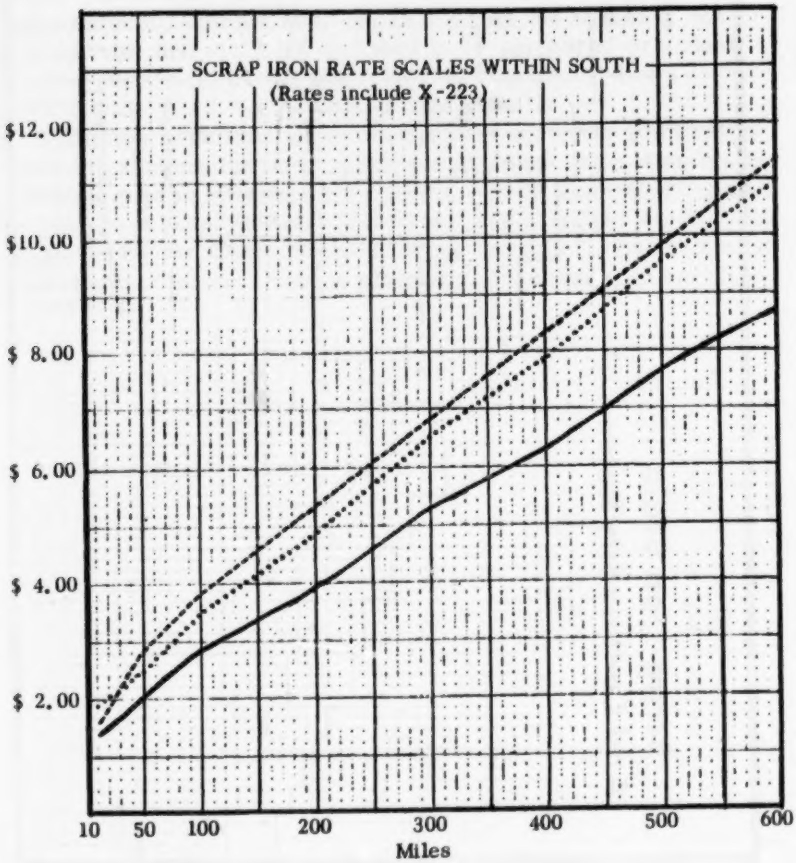
[5] 6%

[6] 3%

[7] No increase applicable. Three percent sought, however, Supplement 21 to Tariff of Increased Rates and Charges X-295-A suspended the increase on scrap iron until November 10, 1974.

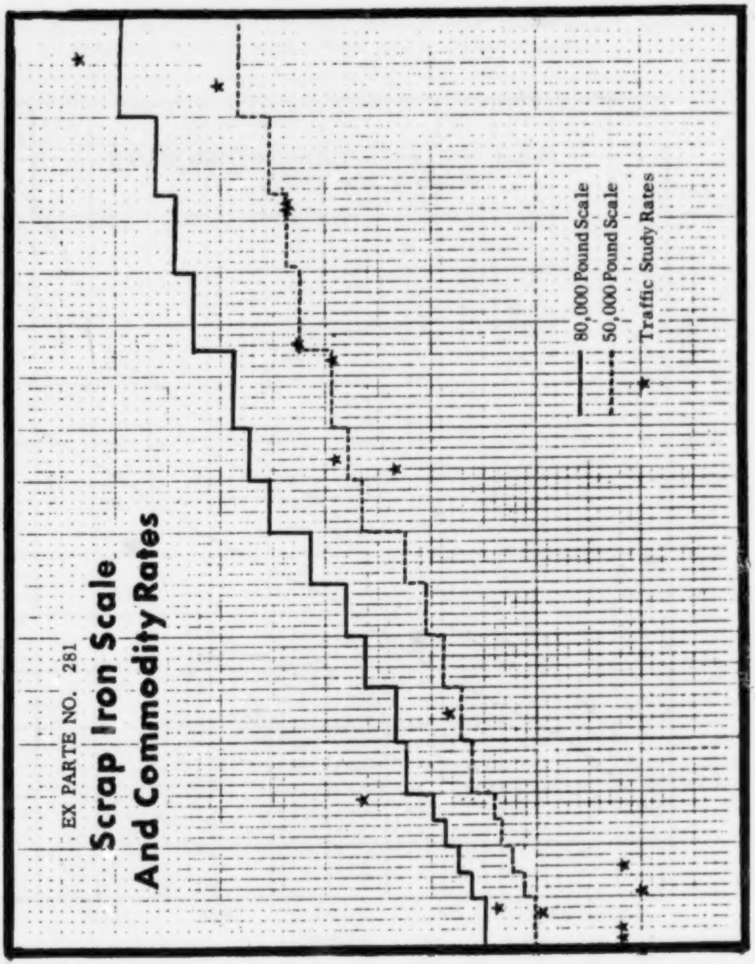
NT-Per ton of 2,000 pounds.

FIGURE 19



------ 80,000 Pound Rates Effective 1932
.... Present 80,000 Pound Rates
——— Present 500,000 Pound Rates

FIGURE 20


EX PARTE NO. 281
Scrap Iron Scale
And Commodity Rates
80,000 Pound Scale
50,000 Pound Scale
Traffic Study Rates

Early scale rates on movements into and within the Southwest included the Memphis-southwestern scale at 16 percent of first class, the Texas scale and the Oklahoma scale. These rates apparently fell into disuse in the 1920's with the advent of 50,000-pound rates first at 17 1/2 and then at 15 percent of first class. A further adjustment during this period was the creation of a 75,000-pound scale at 12 1/2 percent of first class.

Additional scale rates were added in 1959 at 30,000- and 100,000-pound minimums, the latter to meet truck competition. Apparently, the scale rates in effect today at 30,000-, 50,000, and 100,000-pound minima have been increased only by the general freight rate incrases approved by the Commission and shown in table 71. Point-to-point commodity rates have been established to meet barge competition.

Table 71

History of ex parte increases on scrap-iron from, to and within Southwestern Territory (40 211)

Ex Parte Tariff No.	Effective Date	Sought	Authorized	Applied	Authority
X-256------	Aug. 19, 1967----	----------------------Same as Applied--------------------		(Rates not over 200¢-10¢ NT, 11¢ GT) (Rates over 200-600¢-20¢ NT, 22¢ GT) (Rates over 600-1600¢-40¢ NT, 45¢ GT) (Rates over 1600¢ -60¢ NT, 67¢ GT)	329 ICC 896
X-256------	Mar. 18, 1968----			10¢ NT or GT	332 ICC 331
X-259------	May 27, 1968-----	Rates not over $8-25¢ NT or GT Rates over $8 - 5%	Tariff never became effective - Cancelled by X-259-A--------------------		
X-259-A----	June 24, 1968----	Rates over $8 - 5%	3%	3%	332 ICC 590
X-259-B----	Nov. 28, 1968----	Rates over $8 - 5%	3%	3%	332 ICC 590
X-259-B----	Jan. 30, 1969----	Rates over $8 - 5%	5%, Max. 20¢ NT or GT	5%, Max. 20¢ NT or GT	332 ICC 714
X-262------	Nov. 18, 1969----	6%	6%	6%	337 ICC 474
X-265------	June 2, 1970-----	6% - Tariff suspended - Never became effective--			
X-265-A----	June 9, 1970-----	6%	5%, Max. 24¢ NT or GT	5%, Max. 24¢ NT or GT	Order May 27, 1970
X-265-B----	Nov. 20, 1970----	6%	6%	6%	Order Nov. 4, 1970 339 ICC 125
X-267------	Nov. 18, 1970----	15%	Tariff suspended - Never became effective-------------------------------		
X-267-A----	Nov. 20, 1970----	15%	8%	8% (1)	339 ICC 209
X-267-B----	Apr. 12, 1971----	15%	11%	11% (2)	339 ICC 258
X-281------	Feb. 15, 1972----	2 1/2% Surcharge	2 1/2% Surcharge	2 1/2% Surcharge	340 ICC 358
X-281-A----	May 1, 1972------	5%	Tariff never became effective - Cancelled by X-281-B--------------------		
X-281-B----	Oct. 23, 1972----	5%	3%	None (3)	341 ICC 413
X-281-B----	Aug. 13, 1973----	5%	5%	5% (4)	341 ICC 413
X-295------	July 29, 1973----	None (3)	Tariff never became effective - Cancelled by X-295-A--------------------		
X-295-A----	Aug. 19, 1973----	None (3)	None (3)	None (3)	344 ICC 598

NOTES
(1) - Between SW&S - 6%
(2) - West to South - 6%
(3) - When transported for purposes of recycling.
(4) - West to SFA - 3%

The last territories for which rate history information has been provided are the Illinois Freight Association (IFA) territory and the western trunkline territory (WTL). Information provided in regard to these territories has been limited and will be briefly set forth. The IFA scrap iron scale shown in table 72 apparently moves little traffic today. The vast majority of traffic in this territory apparently moves on lower point-to-point commodity rates established for competitive purposes. Similar commodity rates are also found in WTL territory on both single-car and multiple-car movements. Primary adjustments in this area appear to come as the result of truck and barge competition. Barge competitive rates are normally set at 110 percent of the barge rate. Increases on both the scale rates and the commodity rates have only been applied as the result of general freight rate increases.

TABLE 72

I.F.A. scrap iron scale (X-281 level)

RB	Rate per gross ton	
	Minimum weight 50,000 pounds	Minimum weight 80,000 pounds
40	$8.14	$7.27
41-45	8.43	7.27
46-50	8.43	7.27
51-55	8.71	7.74
56-60	9.30	7.74
61-65	9.30	8.14
66-70	9.60	8.14
71-75	9.60	8.43
76-80	9.88	8.43
81-85	10.18	8.71
86-90	10.18	8.71
91-95	10.46	9.30
96-100	10.46	9.30
101-110	10.74	9.60
111-120	11.04	9.60
121-130	11.33	10.18
131-140	11.91	10.18
141-150	12.20	10.46

Tariff Authority: IFA2002-T, Item 8110.

Note: Scale is published in c/NT; for purposes of comparison, the rates have been converted to c/GT.

Table 73 presents the WTL scrap scale at the Ex Parte No. 281 level for 100,000- and 112,000-pound minima. Rates for these and other minima under which traffic currently moves are constructed under the following formulas:

Minimum weight (Pounds)	*Rate formula*
50,000	Class 15B, docket No. 17,000, Part 2, Zone 1 scale.
75,000	Class 12 1/2, docket No. 17000, Part 2, Zone 1 scale.
100,000	95 percent of the 75,000-pound rates.
112,000	90 percent of the 75,000-pound rates.

TABLE 73

W.T.L. scrap I/S scales (X-281 level,

RB	Rate per gross ton		RB	Rate per gross ton	
	Minimum weight 100,000 pounds	Minimum weight 112,000 pounds		Minimum weight 100,000 pounds	Minimum weight 112,000 pounds
5	$2.95	$2.77	210	$8.06	$7.34
10	2.95	2.77	220	8.95	8.51
15	2.95	2.77	230	8.95	8.51
20	3.86	3.70	240	8.95	8.51
25	3.86	3.70	260	8.95	8.51
30	3.86	3.70	280	9.24	8.79
35	3.86	3.70	300	9.24	8.79
40	4.63	4.47	320	10.42	9.83
45	4.63	4.47	340	10.42	9.83
50	4.63	4.47	360	10.84	10.42
55	4.63	4.47	380	10.84	10.42
60	5.56	5.23	400	12.62	12.02
65	5.56	5.23	420	12.62	12.02
70	5.56	5.23	440	12.91	12.31
75	5.56	5.23	460	12.91	12.31
80	6.16	5.85	480	12.91	12.31
85	6.16	5.85	500	13.05	12.45
90	6.16	5.85	520	13.05	12.45
95	6.16	5.85	540	13.40	12.75
100	6.16	5.85	560	13.40	12.75
110	6.87	6.16	580	13.92	13.36
120	6.87	6.16	600	13.92	13.36
130	6.87	6.16	620	15.69	14.96
140	7.34	7.04	640	15.69	14.96
150	7.34	7.04	660	15.69	14.96
160	7.34	7.04	680	15.98	15.11
170	7.34	7.04	700	15.98	15.11
180	8.06	7.34	720	16.42	15.69
190	8.06	7.34	740	16.42	15.69
200	8.06	7.34	760	16.42	15.69

Tariff Authority: WTL W-2000-J, Item 4252.

Note: Scale is published in c/NT; for purposes of comparison, the rates have been converted to c/GT.

Ex parte increases as sought, approved, and applied in WTL territory are shown in table 74.

TABLE 74

History of ex parte increases applying on scrap, iron/steel in WTL territory (STCC 40211)

Ex Parte 256 increases sought in carrier's petition (filed May 18, 1967)	Increase authorized by I.C.C.	Increase published in master tariff X-256 effective August 19, 1967
	Interim report	*Group 780*
1/2¢ per hundredweight on rates N/E 10¢. 1¢ per hundredweight on rates over 10¢ but N/E 30¢. 2¢ per hundredweight on rates over 30¢ but N/E 80¢. 3¢ per hundredweight on rates over 80¢.	As proposed in carrier's petition.	1/2¢ per hundredweight on rates N/E 10¢. 1¢ per hundredweight on rates over 10¢ but N/E 30¢. 2¢ per hundredweight on rates over 30¢ but N/E 80¢. 3¢ per hundredweight on rates over 80¢.
	Final report	*Group 780-A effective March 18, 1968*
	Upon further investigation, Commission found that the rates on scrap iron or steel may be reasonably increased 10¢ per ton, net or gross as rated.	10¢ per ton, net or gross as rated. (Colorado intrastate effective October 6, 1967). (Utah intrastate effective January 26, 1968.)
Ex Parte 259, increase sought in carrier's petition (filed March 7, 1968)	*Increase authorized by I.C.C.*	*Increase published in master tariff X-259-A effective June 24, 1968*
25¢ per ton, net or gross as rated on rates N/E $8 per ton, net or gross as rated. Apply 5 percent on rates exceeding $8 per ton, net or gross rated.	Interim increase not to exceed 3 percent subject to maximum no higher than suspended in X-259 tariff.	3 percent.
Ex Parte 259, increase sought in carrier's petition (filed March 7, 1968).	*Increase authorized by I.C.C.*	*Increase published in master tariff X-259-A effective June 24, 1968*
	Final order	*X-259-B, effective November 28, 1968* *Item 845*
	Increases on scrap iron or steel should not exceed 5 percent, maximum 20¢ per ton, net or gross as rated.	3 Percent *Item 845-A effective January 30, 1969* 5 percent, maximum 20¢ per ton, net or gross, as rated. (Colorado intrastate effective March 8, 1969) (Utah intrastate effective May 3, 1969.
Ex Parte 262, increase sought in carrier's petition (filed October 16, 1969).	*Increase authorized by I.C.C.*	*Increase published in master tariff X-262 effective November 18, 1969*
6 percent.	As proposed in carrier's petition	6 percent, (Colorado intrastate effective November 19, 1970) (Utah intrastate effective April 22, 1970).

History of ex parte increase applying on scrap, iron/steel in WTL territory (STCC 40211)-Continued

Ex Parte 265, increase sought in carrier's petition (filed March 3, 1970)	Increased authorized by I.C.C.	Increase published in master tariff X-265-A effective June 9, 1970
6 percent increase on scrap iron/steel.	Interim increase of 5 percent, maximum 24¢ per ton, net or gross as rated.	*Item 80*
		5 percent maximum 24¢ per ton, net or gross as rated.
	Final order	*X-265-B effective November 20, 1970, Item 1*
	Subsequent findings authorized increase on scrap iron/steel as proposed in carriers petition.	6 percent (Colorado intrastate effective February 15, 1974) (Utah intrastate effective August 13, 1973).
Ex Parte 267, increase sought in carrier's petition (filed September 1, 1970).	*Increase authorized by I.C.C.*	*Increase published in master tariff X-267-A effective November 20, 1970 Item 5*
Carriers requested Commission to authorize 15 percent increase. By concurrent motion, petitioners sought authority to increase rates by 8 percent followed by an additional 7 percent.	Interim increase authorized not to exceed 8 percent.	8 percent.
	Final order	*X-267-B effective April 12, 1971 Item 1280*
	Subsequent findings authorized increase on scrap iron/steel not more than 11 percent.	11 percent Colorado intrastate effective February 15, 1974) (Utah intrastate effective August 13, 1973).
Ex Parte 281, increase sought in carrier's petition (filed December 31, 1971).	*Increase authorized by I.C.C.*	*Increase published in master tariff X-281 effective February 5, 1972.*
Applied for a general freight rate increase of 2 1/2 percent to apply as a surcharge.	Authorized railroads to publish 2 1/2 percent interim surcharge.	Surcharge of 2 1/2 percent (Colorado intrastate effective September 1, 1972)
	Final order	*X-281-B effective October 22, 1972*
Subsequently filed petition to February 8, 1972 sought permission to file a selective increase tariff to supplant the surcharge. Scrap iron/steel to receive 5 percent.	Subsequent findings authorized increase as proposed in carrier's petition.	Item 1525 (effective August 13, 1973) 5 percent (Colorado intrastate effective November 22, 1972) (Utah intrastate effective August 13, 1973).
Ex Parte 295, increase sought in carrier's petition (filed April 30, 1973).	*Increase authorized by I.C.C.*	*Increase published in master tariff X-295-A effective August 13, 1973*
(1)No increase on scrap iron/steel being transported for purpose of recycling.	Carriers were generally granted interim increase of 3 percent.	No increase (3 percent authorized increase under suspension). (Colorado intrastate effective October 1, 1973) (Utah intrastate petition filed.) (no decision as yet).

---

(1)Petition was filed on September 24, 1973 seeking an increase of 5 percent.

Part I(D)(3): Revenue yields and cost of service of representative or repetitive movements

The order of December 28, 1973, requested that the parties provide data concerning representative and/or repetitive rates on scrap iron and steel, as of September 1, 1973. These data were to include: origin, destination, rate, minimum weight, actual loading, carload revenue, actual and short-line distances, and ton-mile earnings based on actual distances. The data provided have been adjusted to reflect statistics on a net ton basis. In addition, in order to supplement the record, the Coordinator directed the Section of Cost and Valuation of the Commission to supply the Coordinator with adjusted regional average costs for the typical or representative movements of record.

While no adjustments in rates will be ordered as a result of the calculations made for this section, the data developed have been most significant in the analysis and findings made elsewhere in the report. This compilation of data will provide the Commission the opportunity to study, in depth, the major movments of scrap iron and steel nationwide. No questions have been raised in any of the pleadings as to the actual representative nature of these movements. The Coordinator concludes that these movements are, in fact, representative, and that the financial picture developed accurately reflects the situation existing on September 1, 1973.

The accuracy of this picture is limited by the data provided by the parties. Actual annual use of the involved rates was not provided for each movement. Thus, weighted averages for all movements or particular types of movements could not be developed and simple averages were substituted of necessity. Minor differences in rates or other input data were also noted and statistics were developed for each set of data provided in these cases due to the impossibility of eliminating these differences. Further, "averages" were presented by some of the parties in lieu of more precise data.

In order to insure the greatest possible accuracy in the evaluation of the data, the movements are compiled by territory of origin, type of movement (single-car or multiple-car), and actual car weights. This breakdown allows comparison of similar types of movements on an intraterritory and interterritory basis.

Comparisons of the revenue/cost analysis made in this proceeding with the similar analysis made in Ex Parte No. 270 (Sub-No. 5), Investigation of Railroad Freight Rate Structure—Iron Ores, will be presented in part II(B).

Tables 75 through 96 provide the computation of variable costs for representative rates on scrap iron and steel movements as furnished by the respondents in this proceeding. In addition to the variable costs computations, the fully allocated costs are developed for these movements with constant costs distributed on three bases, i.e., ton and ton-mile, car and car-mile, and dollar bases, to conform with the cost estimates provided in Ex Parte No. 270 (Sub-No. 4), Investigation of Railroad Freight Rate Structure—Coal, and in Ex Parte No. 270 (Sub-No. 5), Investigation of Railroad Freight Rate Structure—Iron Ores. As noted, the cost estimates provided are for the representative movements of record with the exception of the so-called "paper rates" as shown on the exhibits. Also, no cost estimates are provided in those instances where sufficient information was not available to prepare the necessary data.

These cost estimates utilized regional average costs adjusted to reflect operating practices as described below. These adjusted regional average costs, which are stated in dollars per net ton are at the 1973 level of costs, are compared with the rate per net ton as of September 1, 1973, or Ex Parte No. 281-B level. Separate tables are shown for single-car and multiple-car movements, separated by rate territories, distances, and various weight groupings.

TABLE 75

Earnings, rates and costs for single-car movements originating in official territory

Actual weight group: 40,001 to 70,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
			Pounds	*Pounds*	*Cents*	*Cents*						*Percent*	*Percent*	*Percent*	*Percent*
42	Mahwah, N.J	Newark, N.J	46,144	44,000	390.95	17.00	$7.12	$10.13	$10.87	$11.17	$12.85	70	66	69	55
74	Springfield, Ill	Peoria, Ill	45,024	56,000	159.18	6.92	5.23	9.10	9.94	10.38	11.54	57	53	50	45
108	Philadelphia, Pa	Sparrows Point, Md	45,920	44,800	163.16	6.96	7.59	7.62	8.58	9.10	9.87	100	88	83	78
108	do	do	45,920	80,000	117.32	5.10	5.56	7.62	8.58	9.10	9.87	73	65	61	57
117	Herrin, Ill	Federal, Ill	42,342	56,000	114.32	4.08	4.78	5.70	6.40	6.98	7.43	84	75	68	64
117	do	do	56,000	56,000	114.32	4.08	4.78	4.52	5.50	5.42	5.73	106	87	88	83

TABLE 76

Actual weight group: 70,001 to 100,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
7	Beechbottom, W. Va	Follansbee, W. Va	77,952	56,000	1177.14	30.18	2.11	3.56	4.19	4.03	4.51	59	50	52	47
26	Chicago, Ill	Lemont, Ill	97,800	67,200	646.15	13.21	3.44	2.95	3.85	3.49	3.87	117	89	99	89
47	Joliet, Ill	Gary, Ind	70,112	67,200	268.38	7.84	3.60	4.55	5.30	5.25	5.77	79	68	69	62
54	Marion, Ind	Kokomo, Ind	73,920	44,800	232.96	6.30	3.40	4.38	5.17	5.09	5.57	77	66	67	61
58	Toledo, Ohio	Detroit, Mich	85,120	80,000	311.86	7.25	4.21	3.92	4.71	4.54	4.97	107	89	93	85
60.4	Grove City, Pa	Warren, Ohio	98,560	80,000	456.95	9.32	5.63	4.31	5.11	4.85	5.47	131	110	116	103
68.0	Toledo, Ohio	Detroit, Mich	85,120	80,000	270.59	6.79	4.21	4.00	4.83	4.66	5.08	105	87	90	83
82.0	do	do	85,120	80,000	224.39	5.22	4.21	4.13	5.00	4.84	5.24	102	84	87	80
85.3	Chicago, Ill	Milwaukee, Wis	98,992	80,001	232.49	4.84	4.09	3.62	4.68	4.32	4.74	113	87	95	86
110	Meadville, Pa	Cleveland, Ohio	85,120	80,000	286.41	6.86	7.33	4.40	5.35	5.20	5.57	167	137	141	132
126.3	do	do	85,120	80,000	249.45	5.80	7.33	5.53	6.54	6.39	7.01	133	112	115	105
127.5	do	do	85,120	80,000	247.10	5.75	7.33	5.54	6.55	6.41	7.03	132	112	114	104
134.8	do	do	85,120	80,000	233.72	5.44	7.33	5.61	6.64	6.50	7.11	131	110	113	103
177	Fort Wayne, Ind	Lemont, Ill	72,700	58,000	242.93	6.67	11.84	6.68	7.96	7.98	8.57	177	149	148	138
308.4	Elmira Heights, N.Y	Coatesville, Pa	87,360	80,000	154.56	3.51	10.93	7.06	8.64	8.52	8.95	155	127	128	122
405	Marion, Ind	Butler, Pa	99,904	80,000	158.27	3.17	12.82	6.30	8.19	7.87	7.98	203	157	163	161
405	do	do	99,904	112,000	135.56	2.71	10.98	6.30	8.19	7.87	7.97	174	134	140	138
462.2	Cairo, Ill	Lemont, Ill	82,400	80,000	124.83	3.03	14.02	9.40	11.51	11.48	12.10	149	122	122	116
1571	Chicago, Ill	Vinton, Tex	81,400	80,000	66.19	1.62	25.55	16.86	22.16	22.25	22.08	152	115	115	116

TABLE 77

Actual weight group: 100,001 to 180,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
7	Mansfield, Ohio	Mansfield, Ohio	103,040	92,880	1646.14	31.66	1.98	2.75	3.30	3.11	3.49	72	59	64	57
19	Monroe, Mich	Trenton, Mich	125,440	89,300	1005.16	15.95	3.05	2.44	3.10	2.76	3.09	125	98	111	99
22	Bedford, Ohio	Cleveland, Ohio	107,520	UTC Rule 13	479.73	8.88	1.95	2.83	3.50	3.21	3.58	69	56	61	54
22	do	do	107,520	80,000	628.73	11.05	2.43	2.83	3.50	3.21	3.58	86	69	76	68
22	do	do	107,520	44,800	677.45	12.55	2.76	2.83	3.50	3.21	3.58	98	79	86	77
31	Youngstown, Ohio	Koppel, Pa	116,480	80,000	750.77	12.84	3.87	2.74	3.44	3.12	3.47	141	113	124	112
37	Hartford, Conn	New Haven, Conn	118,048	67,200	570.86	9.60	3.58	2.78	3.50	3.17	3.52	129	102	113	102
37	do	do	118,048	89,600	411.41	6.97	2.58	2.78	3.50	3.17	3.52	93	74	81	73
37	do	do	118,048	67,200	695.24	11.78	4.36	2.78	3.50	3.17	3.52	157	125	138	124
37	do	do	118,048	89,600	597.97	10.14	3.75	2.78	3.50	3.17	3.52	135	107	118	107
40.1	Joliet, Ill	Chicago, Ill	104,601	80,000	513.70	9.82	6.55	2.64	3.34	3.06	3.41	248	196	219	192
45	Evansville, Ind	Steelton, Ky	126,792	80,000	470.53	7.42	3.34	1.81	2.32	2.08	2.36	185	144	160	142
45.2	Pontiac, Mich	Flint, Mich	110,920	89,600	465.48	8.02	3.74	3.59	4.34	4.01	4.55	104	86	93	82
45.8	Reading, Pa	Columbia, Pa	120,960	80,000	559.47	9.32	4.23	2.79	3.54	3.20	3.54	152	119	132	119
46	Springfield, Ohio	Middletown, Ohio	116,480	80,000	515.22	8.88	4.23	2.89	3.64	3.31	3.67	146	116	128	115
50	Munhall, Pa	Weirton, W. Va	129,920	80,000	642.20	9.88	4.94	2.66	3.43	3.05	3.38	186	144	162	146
55.2	Newark, N.J	Fairless, Pa	115,580	80,000	542.17	9.35	5.16	3.71	4.49	4.15	4.70	139	115	124	110
55.2	do	do	115,580	44,800	614.67	10.60	5.85	3.71	4.49	4.15	4.70	158	130	141	124
55.3	Elizabethport, N.J	do	116,584	80,000	541.19	9.33	5.16	3.71	4.49	4.15	4.70	139	115	124	110
55.3	do	do	116,584	44,800	613.56	10.58	5.85	3.71	4.49	4.15	4.70	158	130	141	124
56	Irvine, Pa	Weirton, W. Va	105,952	80,000	467.84	8.82	4.94	3.22	4.00	3.71	4.08	153	124	133	121
56.1	Elizabethport, N.J	Fairless, Pa	115,584	80,000	533.48	9.20	5.16	3.71	4.50	4.16	4.71	139	115	124	110
56.1	do	do	115,584	44,800	604.81	10.43	5.85	3.71	4.50	4.16	4.71	158	130	141	124
57.5	Pontiac, Mich	Flint, Mich	116,920	89,600	365.91	6.31	3.74	2.97	3.76	3.41	3.76	126	99	110	99

Earnings, rates and costs for single-car movements originating in official territory--Continued

Actual weight group: 100,001 to 130,000 pounds--Continued

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
			Pounds	*Pounds*	*Cents*	*Cents*						*Percent*	*Percent*	*Percent*	*Percent*
58	Markham, Ill. (Chicago)-------	Indian Oaks, Ill----------	133,814	112,000	447.88	7.34	$4.20	$1.86	$2.50	$2.25	$2.54	215	168	186	165
62.6	Newark, N.J------------------	Fairless, Pa--------------	115,580	80,000	478.08	8.34	5.16	3.76	4.87	4.23	4.77	187	113	122	109
62.6	-------------do-------------	-----------do------------	115,580	44,800	542.01	9.34	5.85	3.76	4.87	4.23	4.77	156	120	138	123
69.2	Pontiac, Mich----------------	Saginaw, Mich ------------	123,200	89,600	420.53	6.78	4.94	3.61	4.43	4.06	4.57	137	112	122	109
70	Springfield, Ohio------------	Middletown, Ohio----------	118,480	80,000	338.57	5.84	4.23	3.78	4.62	4.28	4.81	112	92	99	88
74	Springfield, Ill ------------	Peoria, Ill---------------	107,520	100,000	305.51	5.68	4.21	4.10	4.04	4.63	5.10	103	85	91	81
75.9	Allentown, Pa----------------	Coatesville, Pa-----------	119,997	80,000	416.41	6.94	5.27	3.84	3.89	3.52	3.85	173	135	150	137
79.1	Monroe, Mich-----------------	Defiance, Ohio------------	116,480	112,000	469.19	6.09	6.37	3.86	4.72	4.37	4.90	185	135	146	130
80.8	Pontiac, Mich----------------	Saginaw, Mich-------------	123,200	89,600	360.16	5.81	4.94	3.81	3.87	3.47	3.82	184	120	142	129
84.2	Chicago, Ill-----------------	Milwaukee, Wis------------	116,480	60,010	282.85	4.88	4.09	3.61	3.63	3.29	3.68	146	113	129	113
86.1	Monroe, Mich-----------------	Defiance, Ohio------------	116,480	112,000	431.05	7.43	6.37	3.92	4.79	4.44	4.97	163	133	140	128
108	Williamsport, Pa-------------	Steelton, Pa--------------	120,960	80,000	370.37	6.17	6.68	3.28	4.30	3.61	4.13	205	159	175	162
109.5	Chicago, Ill-----------------	Sterling, Ill-------------	116,480	60,009	212.75	3.87	4.00	2.97	3.87	3.51	3.84	135	160	114	154
110	Meadville, Pa----------------	Cleveland, Ohio-----------	120,960	100,000	358.18	5.97	6.57	3.27	4.23	3.83	4.15	201	156	172	158
116.8	Koenig, Mich-----------------	Defiance, Ohio------------	123,200	112,000	335.51	5.41	6.37	3.95	4.93	4.52	5.01	161	129	141	127
119.4	Chicago, Ill-----------------	Sterling, Ill-------------	124,947	112,000	195.14	3.12	3.70	3.23	4.39	3.84	4.23	117	86	98	89
126.3	Meadville, Pa----------------	Cleveland, Ohio-----------	120,960	100,000	311.95	5.29	6.87	4.08	5.09	4.68	5.18	161	129	140	127
127.5	-------------do-------------	-----------do------------	120,960	100,000	309.01	5.15	6.87	4.09	5.10	4.70	5.18	161	128	140	127
132	Grand Rapids, Mich-----------	Saginaw, Mich-------------	122,080	89,600	280.05	4.59	6.08	3.41	4.43	4.02	4.32	178	137	151	148
132	-------------do-------------	-----------do------------	122,080	44,800	341.51	5.60	7.39	3.41	4.43	4.02	4.32	217	167	164	171
134.9	Meadville, Pa----------------	Cleveland, Ohio-----------	120,080	100,000	292.28	4.87	6.57	4.15	5.18	4.77	5.26	158	127	138	125
140	Decatur, Ill-----------------	Granite City, Ill---------	126,560	112,000	188.68	3.01	4.30	3.37	4.42	3.98	4.27	125	95	106	98
145	Chicago Heights, Ill---------	Peoria, Ill---------------	126,345	112,000	121.38	1.92	5.33	3.80	4.82	4.39	4.87	140	111	121	109
147.2	Pontiac, Mich----------------	Defiance, Ohio------------	100,800	112,000	233.87	4.68	6.37	5.78	6.84	6.55	7.31	111	93	97	87
160.8	McGrew, Mich-----------------	-----------do------------	112,000	112,000	270.21	4.82	7.08	4.63	5.74	5.37	5.87	152	123	131	120
164	Alexandria, Va---------------	Lynchburg, Va-------------	122,000	90,000	229.49	3.76	6.17	2.39	3.21	2.99	3.10	258	152	211	199
164.3	Meadville, Pa----------------	Youngstown, Ohio----------	120,960	112,000	187.46	3.12	5.13	4.36	5.49	5.06	5.59	118	98	105	98
171.5	Elizabethport, N.J-----------	Steelton, Pa--------------	105,280	80,000	244.45	4.61	7.97	4.97	6.12	5.79	6.30	160	130	137	126
175	Grand Rapids, Mich-----------	Saginaw, Mich-------------	122,000	89,600	211.23	3.47	6.06	3.72	4.89	4.45	4.72	163	124	138	120
175	-------------do-------------	-----------do------------	122,080	44,800	257.59	4.22	7.39	3.72	4.89	4.45	4.72	199	151	166	157
177.1	Elizabethport, N.J-----------	Steelton, Pa--------------	105,280	80,000	236.73	4.47	7.97	5.01	6.18	5.85	6.35	188	129	136	125
182.4	Chicago, Ill-----------------	Davenport, Iowa-----------	122,950	80,000	209.97	3.50	9.95	3.32	4.42	3.98	4.28	300	225	250	232
185.9	Williamsport, Pa-------------	Steelton, Pa--------------	120,960	80,000	204.19	3.40	6.80	3.90	6.18	4.66	4.95	171	130	143	135
230	Goodman, Ohio----------------	Buffalo, N.Y--------------	118,720	112,000	204.10	3.46	6.38	4.21	5.55	5.09	5.34	199	151	185	157
247	Markham, Ill. (Chicago)-------	Federal, Ill--------------	128,670	112,000	133.48	2.08	5.13	3.08	4.05	3.58	3.92	171	127	183	151
260	Chicago, Ill-----------------	-----------do------------	127,680	112,000	126.72	1.98	5.13	3.08	4.17	3.80	4.00	166	123	135	127
262.8	Chicago Heights, Ill---------	Dearborn, Mich------------	112,000	112,000	214.76	3.83	10.08	5.42	6.80	6.44	6.87	186	147	157	147
277.39	Gary, Ind -------------------	Middletown, Ohio----------	103,040	80,000	185.19	3.57	10.08	5.92	7.41	7.08	7.51	170	138	142	134
298	Goodman, Ohio----------------	Buffalo, N.Y--------------	118,720	112,000	157.53	2.87	8.36	4.73	6.27	5.77	5.99	178	134	145	140
303	Chicago, Ill-----------------	Federal, Ill--------------	127,904	112,000	108.17	1.69	5.13	5.18	6.73	6.15	6.84	99	76	83	78
325.6	Chicago Heights, Ill---------	Dearborn, Mich------------	112,000	112,000	173.34	3.10	10.08	6.64	8.28	7.83	8.42	152	122	129	120
334.7	Granite City, Ill------------	Chicago, Ill--------------	129,210	80,000	54.37	.84	12.06	5.05	6.66	6.05	6.45	238	180	109	187
337.62	Gary, Ind--------------------	Middletown, Ohio----------	103,040	80,000	152.15	2.93	10.08	6.42	8.09	7.75	8.14	157	125	130	124
366	Glassport, Pa----------------	Fort Wayne, Ind-----------	101,920	112,000	146.32	2.87	10.22	6.70	8.47	8.13	8.50	153	121	126	120
442	Buffalo, N.Y-----------------	Fairless, Pa--------------	109,984	112,000	144.84	2.63	11.84	6.14	8.15	7.67	7.79	190	143	152	149
464	-------------do-------------	-----------do------------	109,984	112,000	137.97	2.31	11.84	7.08	9.16	8.67	8.97	164	127	134	130
503	Saginaw, Mich----------------	Danville, Ill-------------	112,000	112,000	108.84	1.90	9.88	6.53	8.56	8.10	8.34	151	115	122	118
592	Buffalo, N.Y-----------------	Fairless, Pa--------------	109,984	112,000	108.14	1.97	11.84	8.08	10.57	10.02	10.24	144	110	118	114

TABLE 78

Earnings, rates and costs for single-car movements originating in official territory

Actual weight group: 130,001 to 160,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Car and car-mile (11)	Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Car and car-mile (15)	Dollar basis (16)
			Pounds	*Pounds*	*Cents*	*Cents*						*Percent*	*Percent*	*Percent*	*Percent*
21	Aliquippa, Pa	Pittsburgh, Pa	145,600	50,000	678.86	9.30	$1.91	$2.16	$2.83	$2.44	$2.74	88	67	78	70
21.3	French Landing, Mich	Detroit, Mich	158,800	123,200	1098.22	14.08	3.00	2.03	2.70	2.30	2.57	1.48	111	130	117
41	Grand Blanc, Mich	Saginaw, Mich	132,160	112,000	429.49	8.48	2.71	2.56	3.30	2.92	3.25	106	82	93	83
46	Portsmouth, Ohio	Huntington, W. Va	141,725	112,000	513.04	7.23	3.33	3.04	3.79	3.39	3.88	110	88	98	86
51	Toledo, Ohio	Defiance, Ohio	141,120	112,000	411.76	5.80	3.26	2.49	3.26	2.85	3.16	131	100	114	103
52	Cincinnati, Ohio	Whitfield, Ohio	134,400	112,000	559.73	8.35	4.38	2.60	3.37	2.98	3.30	168	130	147	133
62	Toledo, Ohio	Defiance, Ohio	141,120	112,000	338.71	4.77	3.26	2.56	3.37	2.95	3.25	127	97	111	100
63	Newark, N.J	Roebling, N.J	143,360	112,000	542.32	7.53	4.89	3.13	3.93	3.50	3.96	156	124	140	123
75.9	Allentown, Pa	Coatesville, Pa	140,000	134,400	431.49	6.16	4.68	2.68	3.52	3.09	3.39	175	133	151	138
87	Toledo, Ohio	Defiance, Ohio	141,120	112,000	241.38	3.40	3.26	3.33	4.21	3.76	4.22	98	77	87	77
91.4	Moline, Ill	Peoria, Ill	146,070	80,000	396.08	5.43	8.39	2.39	3.23	2.78	3.08	351	259	301	272
92	Toledo, Ohio	Defiance, Ohio	141,120	112,000	228.26	3.21	3.26	3.36	4.26	3.81	4.26	97	77	86	77
105	Decatur, Ill	Federal, Ill	145,824	112,000	291.40	3.80	4.20	3.36	4.30	3.82	4.26	125	98	110	99
105	Toledo, Ohio	Defiance, Ohio	141,120	112,000	200.00	2.82	3.26	3.45	4.39	3.92	4.37	94	74	83	75
119	Detroit, Mich	do	159,040	112,000	476.33	5.33	6.37	3.22	4.20	3.66	4.08	198	152	174	156
121.1	do	do	159,040	112,000	418.93	5.24	6.37	3.23	4.22	3.68	4.09	197	151	173	156
121.8	do	do	159,040	112,000	416.53	5.21	6.37	3.23	4.23	3.69	4.10	197	151	173	155
144.1	do	do	159,040	112,000	352.07	4.40	6.37	3.37	4.44	3.87	4.28	189	143	165	149
150.7	do	do	159,040	112,000	336.65	4.21	6.37	3.41	4.50	4.24	4.33	187	142	150	147
277	Norpaul, Ill. (Chicago)	Federal, Ill	131,056	112,000	121.25	1.85	5.12	3.54	4.66	4.27	4.61	145	110	120	111
288	Detroit, Mich	Weirton, W. Va	140,000	44,800	315.49	4.51	12.98	4.71	6.23	5.58	5.97	276	208	233	217
288	do	do	140,000	80,000	276.11	3.94	11.36	4.71	6.23	5.58	5.97	241	182	204	190
288	do	do	140,000	112,000	245.00	3.50	10.08	4.71	6.23	5.58	5.97	214	162	181	169
291	do	do	140,000	44,800	312.23	4.46	12.98	4.13	5.66	5.00	5.23	314	229	260	248
291	do	do	140,000	80,000	273.26	3.90	11.36	4.13	5.66	5.00	5.23	275	201	227	217
291	do	do	140,000	112,000	242.47	3.46	10.08	4.13	5.66	5.00	5.23	244	178	202	193
297	Dearborn, Mich	do	140,000	44,800	305.93	4.37	12.98	4.77	6.32	5.67	6.04	272	205	229	215
297	do	do	140,000	80,000	267.74	3.82	11.36	4.77	6.32	5.67	6.04	238	180	200	188
297	do	do	140,000	112,000	237.58	3.39	10.08	4.77	6.32	5.67	6.04	211	159	178	167
306.4	Elmira Heights, N.Y	Coatesville, Pa	141,120	134,400	207.72	2.93	9.04	4.80	6.38	5.70	6.08	188	142	159	149
319	Chicago, Ill	Federal, Ill	131,936	112,000	105.98	1.61	5.13	5.15	6.77	6.15	6.53	100	76	83	79
322.4	Midwest (Portage), Ind	do	135,968	112,000	108.20	1.59	5.13	5.05	6.68	6.02	6.40	102	77	85	80
322.4	do	do	135,968	56,000	192.99	2.84	9.15	5.05	6.[illegible]	6.02	6.40	181	137	152	143
322.4	do	do	135,968	90,000	176.12	2.59	8.35	5.05	6.[illegible]	6.02	6.40	165	125	139	130
325.6	Federal, Ill	Chicago, Ill	133,731	80,000	58.66	0.88	12.06	4.85	6.43	5.80	6.20	249	188	208	194
347	Fort Wayne, Ind	Brackenridge, Pa	134,870	80,000	249.17	3.72	12.82	4.63	6.34	5.67	5.87	277	202	226	218
360	do	do	134,870	90,000	240.17	3.58	12.82	5.34	7.09	6.41	6.77	240	181	200	189
397	Dearborn, Mich	Weirton, W. Va	140,000	44,800	228.87	3.27	12.98	5.44	7.31	6.55	6.90	239	178	198	188
397	do	do	140,000	80,000	200.30	2.86	11.36	5.44	7.31	6.55	6.90	209	155	173	165
397	do	do	140,000	112,000	177.73	2.54	10.08	5.44	7.31	6.55	6.90	185	138	154	146

TABLE 79

Actual weight group: 160,001 to 190,000 pounds

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
162	French Landing, Mich	Cleveland, Ohio	162,190	112,000	343.72	4.24	6.87	2.91	4.03	3.43	3.69	236	170	200	186

TABLE 80

Earnings, rates and costs for multiple-car movements originating in official territory

Actual weight group: 70,001 to 100,000 pounds

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
405	Marion, Ind	Butler, Pa	99,904	500 GT	110.08	2.20	8.91	5.13	7.02	6.70	6.50	174	127	133	137

TABLE 81

Earnings, rates and costs for multiple-car movements originating in official territory

Actual weight group: 100,001 to 130,000

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
			Pounds	*Pounds*	*Cents*	*Cents*						*Percent*	*Percent*	*Percent*	*Percent*
45	Evansville, Ind	Steelton, Ky	115,977	500,000	390.47	6.73	$2.71	$1.33	$1.85	$1.64	$1.74	204	146	165	156
50	Munhall, Pa	Weirton, W. Va	129,920	600 GT	569.40	9.59	4.38	1.76	2.53	2.15	2.24	249	173	204	196
55.2	Newark, N.J	Fairless, Pa	115,504	500 GT	453.91	7.83	4.32	2.68	3.46	3.13	3.40	161	125	138	127
55.3	Elizabethport, N.J	do	115,504	112,000 500 GT	453.09	7.81	4.32	2.68	3.46	3.13	3.40	161	125	138	127
56	Irvin, Pa	Weirton, W. Va	105,952	600 GT	414.54	7.82	4.38	2.11	2.90	2.60	2.68	208	151	168	163
56.1	Elizabethport, N.J	Fairless, Pa	115,504	500 GT	446.83	7.70	4.32	2.37	3.14	2.82	3.01	182	138	153	144
62.6	Newark, N.J	do	115,580	500 GT	400.26	6.90	4.32	2.73	3.54	[illegible]	3.47	158	122	135	124
171.5	Elizabethport, N.J	Steelton, Pa	123,200	220 GT	222.89	3.59	6.21	3.39	4.55	4.10	4.30	183	136	151	144
171.5	do	do	112,000	1200 GT	168.76	2.98	5.11	3.65	4.00	4.42	4.63	140	106	116	110
177.1	do	do	123,200	220 GT	215.54	3.48	6.21	3.43	4.60	4.15	4.36	181	135	150	142
177.1	do	do	112,000	1200 GT	161.49	2.88	5.11	3.69	4.86	4.48	4.68	138	105	[illegible]	109
215	Mount Clare, Md	do	118,720	18 cars 900 GT	122.90	2.08	4.13	3.81	5.10	4.63	4.83	108	81	89	86
276	Evansville, Ind	Madison, Ill	112,000	5 cars 500 GT	118.83	2.12	5.02	2.87	4.00	3.71	3.75	203	146	156	155
277.38	Gary, Ind	Middleton, Ohio	123,200	500 GT	199.32	3.21	8.91	4.16	5.65	5.12	5.28	214	158	174	169
337.62	do	do	123,200	500 GT	183.76	2.84	8.91	4.60	6.28	5.71	5.83	194	142	156	153
381	Parma, Ohio	East Buffalo, N.Y	116,480	250 GT	123.99	2.14	7.35	4.42	6.24	5.71	5.61	166	118	129	131
442	Buffalo, N.Y	Fairless, Pa	109,984	500 GT	113.24	2.06	9.10	5.12	7.13	6.65	6.49	178	128	137	140
404	do	do	109,984	500 GT	107.87	1.96	9.10	6.00	8.08	7.59	7.60	152	113	120	120
471	Evansville, Ind	Birmingham, Ala	124,480	500,000	101.35	1.63	7.67	3.82	5.46	5.00	4.99	201	141	153	154
530	So. Chicago, Ill	Homestead, Pa	120,960	500 GT	100.88	1.68	8.91	6.76	9.05	8.37	8.57	132	98	106	104
502	Buffalo, N.Y	Fairless, Pa	109,984	500 GT	84.54	1.54	9.10	7.00	9.40	8.94	8.88	130	96	102	102

TABLE 82

Actual weight group: 130,001 to 160,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
102	Sparrows Pt., Md	Steelton, Pa	147,840	1,200 GT	224.17	3.03	5.59	1.94	2.07	2.39	2.46	185	125	150	146
104	Newark, N.J	Conshohocken, Pa	159,040	112,000 500 GT	432.30	5.40	5.04	2.38	3.31	2.79	3.01	245	176	209	194
109.5	Chicago, Ill	Sterling, Ill	134,400	134,400	216.99	3.24	3.54	1.94	2.83	2.40	2.50	182	125	148	142
109.5	do	do	134,400	672,000	216.99	3.24	3.54	1.94	2.83	2.40	2.50	182	125	148	142
130	Sparrows Pt., Md	Steelton, Pa	147,840	1,200 GT	175.88	2.38	3.59	2.68	3.70	3.18	3.40	134	97	113	106
172.3	Newark, N.J	Coatesville, Pa	154,560	112,000 300 GT	254.17	3.30	5.84	2.86	4.01	3.42	3.63	204	146	171	161
178	do	do	154,560	112,000 500 GT	246.03	3.20	5.84	2.90	4.07	3.47	3.67	201	143	169	159
288	Detroit, Mich	Weirton, W. Va	140,000	112,000 500 GT	218.56	3.09	8.91	3.86	5.38	4.73	4.89	231	166	188	182
291	do	do	140,000	112,000 500 GT	224.30	3.08	8.91	3.28	4.82	4.17	4.17	272	185	214	214
297	Dearborn, Mich	do	140,000	112,000 500 GT	210.00	3.00	8.91	3.66	5.21	4.53	4.64	243	171	198	192
347	Fort Wayne, Ind	Brackenridge, Pa	134,870	112,000 300 GT	172.91	2.58	8.91	3.76	5.47	4.80	4.77	237	163	186	187
380	do	do	134,870	112,000 500 GT	166.67	2.49	8.91	4.46	6.21	5.53	5.68	200	143	161	157
387	Dearborn, Mich	Weirton, W. Va	140,000	112,000 500 GT	157.10	2.24	8.91	3.93	5.47	4.81	4.97	227	163	185	179

TABLE 83

Actual weight group: 160,001 to 180,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
9	Zanesville, Ohio	Philo, Ohio	176,960	2 cars 140 GT	1,463.87	16.63	1.53	1.07	1.70	1.28	1.36	143	90	120	113

TABLE 94

Earnings, rates and costs for single-car movements originating in southern territory

Actual weight group: 60,001 to 70,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton			Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs		
									Ton and ton-mile (10)	Car and car-mile (11)	Dollar basis (12)		Ton and ton-mile (14)	Car and car-mile (15)	Dollar basis (16)
			Pounds	*Pounds*	*Cents*	*Cents*						*Percent*	*Percent*	*Percent*	*Percent*
4	Birmingham, Ala	N. Birmingham, Ala	68,000	80,000	2009.25	59.10	$1.19	$2.37	$2.76	$2.73	$3.08	50	43	44	39
29	Cleveland, Tenn	Chattanooga, Tenn	64,000	50,000	391.72	12.24	3.55	2.83	3.30	3.32	3.68	125	108	107	96
105	McComb, Miss	New Orleans, La	62,440	50,000	178.40	5.71	6.00	3.94	4.61	4.76	5.14	152	130	126	117
110	Louisville, Ky	Steelton, Ky	50,000	50,000	353.61	14.15	5.83	4.84	5.52	5.89	6.31	120	106	99	92
273	Hattiesburgh, Miss	New Orleans, La	59,956	50,000	70.83	2.36	6.45	5.70	6.82	7.29	7.44	113	95	88	87
524.3	Albany, Ga	Mobile, Ala	56,400	50,000	57.21	2.00	10.65	10.16	12.23	13.19	13.11	105	87	81	81
TABLE 95															
Actual weight group: 70,001 to 100,000															
8	Tuscaloosa, Ala	Holt, Ala	100,000	80,000	2275.00	45.50	2.73	1.83	2.24	2.08	2.38	149	122	131	115
43	Cross Bayou, Fla	Tampa, Fla	98,820	80,000	326.86	6.66	2.86	2.20	2.71	2.55	2.87	130	106	112	100
93	Orlando, Fla	do	82,040	80,000	208.92	5.04	4.68	3.03	3.67	3.63	3.96	155	128	129	118
102	Toronto, Fla	do	75,160	80,000	176.04	4.69	4.78	3.33	4.00	4.01	4.35	144	120	119	110
116	Columbus, Ga	Atlanta, Ga	90,000	80,000	148.58	3.30	3.83	2.73	3.42	3.32	3.55	140	112	115	108
149.9	Tupelo, Miss	Woodlawn, Ala	87,667	80,000	164.10	3.70	5.61	4.09	5.10	4.92	5.28	137	110	114	106
183	Jackson, Miss	New Orleans, La	86,014	80,000	144.51	3.36	6.15	3.58	4.46	4.42	4.68	172	138	139	131
202.7	Jackson, Tenn	Newport, Ark	91,840	99,904	166.22	3.61	7.34	4.65	5.70	5.55	6.02	158	129	132	122
222	Owensboro, Ky	Newport, Ky	80,567	80,000	126.62	3.14	6.82	4.08	5.06	5.09	5.32	167	135	134	128
254	Memphis, Tenn	Birmingham, Ala	85,250	80,000	129.74	3.04	7.73	4.12	5.18	5.17	5.38	188	149	150	144
258	Knoxville, Ky	No. Birmingham, Ala	78,875	80,000	121.42	2.04	5.26	5.32	6.41	6.55	6.96	99	82	80	76
273	Hattiesburgh, Miss	New Orleans, La	85,615	80,000	82.48	1.93	5.26	4.27	5.30	5.30	5.57	123	99	99	94
296	Nashville, Tenn	Newport, Ky	85,833	80,000	119.76	2.79	8.26	4.44	5.61	5.61	5.79	186	147	147	143
414	Atlanta, Ga	Georgetown, S.C	86,500	80,000	113.71	2.68	10.88	5.28	6.77	6.80	6.89	206	161	160	158
468	do	do	82,000	80,000	80.56	1.97	9.20	6.55	8.18	8.33	8.55	140	112	110	108
485	Memphis, Tenn	Newport, Ky	80,000	80,000	63.10	1.58	7.65	6.17	7.85	8.05	8.05	124	97	95	95
524.3	Albany, Ga	Mobile, Ala	86,400	80,000	70.95	1.60	8.61	7.16	9.23	9.13	9.24	120	93	94	93
TABLE 96															
Actual weight group: 100,001 to 130,000 pounds															
1	Boyles, Ala	No. Birmingham, Ala	120,549	Rate per car	5998.00	99.52	.99	1.51	1.91	1.71	1.87	66	52	58	53
2	No. Birmingham, Ala	E. Birmingham Ala	120,000	80,000	4018.50	66.98	1.19	1.34	1.79	1.53	1.73	89	66	78	69
7	Rockwood, Tenn	Emory Gap, Tenn	106,000	100,000	1423.43	26.86	1.88	1.56	1.96	1.80	2.02	121	96	104	93
8	No. Birmingham, Ala	Tarrant, Ala	120,000	80,000	1785.00	29.75	2.38	1.39	1.80	1.64	1.80	171	132	145	132
11	Charlotte, N.C	Croft, N.C.	126,000	80,000	883.26	8.78	.61	1.35	1.76	1.56	1.75	45	35	39	35
16	No. Birmingham, Ala	Bessemer, Ala	130,000	80,000	502.31	7.73	1.19	1.35	1.78	1.56	1.75	88	67	76	68
35	Statesville, N.C	Croft, N.C	126,000	100,000	496.80	7.89	2.76	1.54	2.03	1.80	2.01	179	136	153	137
36	Ashland, Ky	New Boston, Ohio	123,200	80,000	547.61	8.89	3.33	3.33	4.05	3.70	4.22	100	82	90	79
48	do	do	123,200	80,000	428.57	6.96	3.33	3.44	4.19	3.84	4.36	97	79	87	76
46	Dillon, S.C	Floyd, S.C	112,560	100,000	352.91	6.26	2.88	2.00	2.51	2.32	2.61	144	115	124	110
74	Charleston, S.C	Georgetown, S.C	105,020	100,000	234.28	4.46	3.30	2.35	2.94	2.77	3.07	140	112	119	107
93	Chattanooga, Tenn	Alabama City, Ala	114,000	80,000	210.22	3.69	3.43	2.08	2.72	2.51	2.72	165	126	137	126
94	Macon, Ga	Altanta, Ga	106,000	80,000	213.69	4.03	3.79	2.23	2.86	2.68	2.90	170	133	141	131
105	McComb, Miss	New Orleans, La	109,865	80,000	272.96	4.96	4.89	2.47	3.14	2.94	3.22	198	156	166	152
109	Louisville, Ky	Newport, Ky	105,529	80,000	293.40	5.56	4.60	2.57	3.25	3.07	3.35	179	142	150	137
117.7	Memphis, Tenn	Newport, Ark	122,080	99,904	234.03	3.84	5.50	2.92	3.84	3.45	3.77	188	143	159	146
142	Ashland, Ky	New Boston, Ohio	123,200	80,000	138.83	2.24	3.33	4.14	5.19	4.77	5.25	80	64	70	63
146	Gainesville, Fla	Tampa, Fla	104,900	80,000	158.14	3.01	4.40	2.82	3.60	3.41	3.68	156	122	129	120
153	Wilmington, N.C	Georgetown, S.C	101,120	80,000	149.24	2.95	4.52	2.96	3.75	3.59	3.86	153	121	126	117
164	Nashville, Tenn	Emory Gap, Tenn	116,000	112,000	172.94	2.98	4.89	2.48	3.31	3.08	3.24	198	148	159	151
183	Columbia, S.C	Georgetown, S.C	109,540	100,000	137.98	2.52	4.61	2.97	3.66	3.63	3.87	155	126	127	119
196	Charlotte, N.C	Floyd, S.C	127,880	80,000	129.58	1.96	3.97	3.12	4.04	3.71	4.07	127	98	107	98
204	Columbia, S.C	Georgetown, S.C	114,080	100,000	155.06	2.72	5.55	3.46	4.40	4.14	4.52	160	126	134	123
232	Jackson, Miss	Holt, Ala	114,700	80,000	156.23	2.72	6.32	3.17	4.17	3.90	4.13	199	152	162	153

Earnings, rates and costs for single-car movements originating in southern territory—Continued

Actual weight group: 100,001 to 130,000 pounds—Continued

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
			Pounds	*Pounds*	*Cents*	*Cents*						*Percent*	*Percent*	*Percent*	*Percent*
232	Troy, Ala	Blakely, Ala	120,200	80,000	100.52	2.90	$6.84	$3.68	$4.76	$4.28	$4.52	186	144	160	151
249	Ferguson, Ala	Steelton, Ky	109,110	80,000	148.28	2.73	6.82	3.88	4.93	4.88	5.06	176	138	140	135
273	Athens Park, Ga	Floyd, S.C	113,860	80,000	130.58	2.29	6.26	3.44	4.56	4.26	4.49	182	137	146	139
290	Kernersville, N.C	do	114,720	80,000	88.58	1.54	4.46	3.97	5.13	4.84	5.18	113	87	93	86
370.6	New Orleans, La	Houston, Tex	129,472	89,600	134.33	2.07	7.89	4.35	5.99	5.36	5.62	181	132	147	140
483	Nashville, Tenn	Blakely, Ala	125,200	80,000	148.24	2.40	11.44	5.17	7.13	6.45	6.67	221	160	177	172
483	Atlanta, Ga	Georgetown, S.C	108,720	80,000	91.17	1.66	8.03	5.34	7.01	6.70	6.96	150	115	120	115
515	Knoxville, Tenn	No. Birmingham, Ala	101,883	80,000	76.46	1.50	7.73	5.35	7.11	6.90	6.98	144	109	112	111
728.2	Appliance Park, Ky	Blakely, Ala	120,800	80,000	121.39	2.00	14.63	6.89	9.55	8.75	8.89	212	153	167	165
943	Birmingham, Ala	Swan, Tex	122,080	79,868	90.76	1.52	14.48	8.32	11.42	10.57	10.78	174	127	137	134
1108.3	Atlanta, Ga	do	125,880	79,984	96.78	1.53	16.94	9.00	11.02	11.42	11.78	188	154	148	144

TABLE 87

Actual weight group: 130,001 to 160,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
15	Bessemer, Ala	No. Birmingham, Ala	134,101	80,000	508.33	8.79	1.19	1.49	1.92	1.70	1.94	80	62	70	61
40	Roanoke, Va	Radford, Va	132,160	80,000	635.81	9.63	4.16	2.58	3.32	2.94	3.27	161	125	141	127
54	do	Lynchburg, Va	141,120	85,000	571.94	8.08	4.35	2.51	3.26	2.88	3.18	173	133	151	137
54	do	do	141,120	44,000	653.46	9.26	4.97	2.51	3.28	2.88	3.18	198	151	173	156
110	Louisville, Ky	Steelton, Ky	148,771	80,000	339.37	4.31	4.75	1.98	2.68	2.33	2.58	240	178	204	184
177	Ashland, Ky	Middletown, Ohio	141,120	112,000	244.08	3.65	6.22	3.93	5.10	4.58	4.88	158	122	136	126
187	do	do	141,120	112,000	231.76	3.28	6.22	4.00	5.20	4.65	5.07	156	120	134	123
244.9	Oxford, Miss	Mobile, Ala	146,000	80,000	189.91	2.60	6.97	3.35	5.28	4.69	4.98	208	171	191	161
462	Atlanta, Ga	Georgetown, S.C	130,000	80,000	119.52	1.72	7.98	4.40	6.01	5.44	5.76	181	132	146	138
554	Chattanooga, Tenn	Mobile, Ala	144,000	80,000	133.57	1.88	10.21	5.07	7.23	6.31	6.50	201	141	162	156

TABLE 88

Actual weight group: 70,001 to 100,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
100	McComb, Miss	New Orleans, La	91,500	500,000	107.38	3.93	3.93	2.02	2.65	2.55	2.63	195	148	154	149
140.5	Tupelo, Miss	Woodlawn, Ala	100,000	500,000	151.48	3.80	4.90	2.86	3.87	3.98	3.68	171	126	124	132
157	Decatur, Ala	Holt, Ala	98,381	500,000	90.41	2.06	4.38	3.38	4.40	4.26	4.41	130	100	103	99
355	McComb, Miss	Birmingham, Ala	92,383	500,000	68.38	1.41	7.28	3.89	7.10	7.00	6.89	187	103	104	106

TABLE 89

Actual weight group: 100,001 to 130,000

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
110	Louisville, Ky	Steelton, Ky	114,575	500,000	199.07	3.47	3.82	1.80	2.48	2.38	2.34	212	153	160	163
110	Junction City, Ky	Cincinnati, Ohio	100,000	500,000	188.38	3.85	4.23	1.94	2.67	2.48	2.56	218	158	171	165
130	Kernersville, N.C	Lynchburg, Va	100,000	500,000	175.18	3.37	4.38	2.02	2.78	2.56	2.62	217	158	171	167
183	Jackson, Miss	New Orleans, La	125,860	500,000	170.07	2.72	4.97	2.12	3.00	2.69	2.76	234	166	185	180
219.5	do	Blakely, Ala	125,300	500,000	142.16	2.30	4.98	2.72	3.89	3.42	3.48	183	128	146	143
232	do	Holt, Ala	112,727	500,000	124.63	2.21	5.13	2.85	3.44	3.33	3.37	180	149	154	152
239	S. Raleigh, N.C	Floyd, S.C	100,000	500,000	88.98	1.83	4.38	2.70	3.73	3.50	3.53	162	117	125	124
254	Memphis, Tenn	Birmingham, Ala	113,544	500,000	130.44	2.48	6.26	2.71	3.38	3.51	3.54	231	185	178	177
285.8	Tupelo, Miss	Mobile, Ala	110,000	500,000	123.16	2.30	6.60	3.61	4.96	4.55	4.00	183	133	145	165
332	Memphis, Tenn	Holt, Ala	101,634	500,000	87.26	1.72	5.70	3.44	4.72	4.53	4.49	166	121	126	127
343	Gulfport, Miss	New Orleans, La	104,064	500,000	46.42	0.89	3.06	3.48	4.78	4.55	4.51	88	64	67	68
430	Pensacola, Fla	Woodlawn, Ala	118,960	500,000	86.05	1.50	6.45	4.10	5.99	5.62	5.60	157	108	115	116
433	Memphis, Tenn	No. Birmingham, Ala	100,413	500,000	76.59	1.40	6.07	3.99	5.53	5.27	5.20	152	110	115	117
477	Jackson, Miss	Birmingham, Ala	117,390	500,000	73.59	1.25	5.98	4.01	5.66	5.27	5.23	149	106	113	114
515	Knoxville, Tenn	No. Birmingham, Ala	113,680	500,000	68.21	1.20	6.18	4.29	6.00	5.67	5.58	144	103	109	111

TABLE 90

Earnings, rates and costs for single-car movements originating in western territory

Actual weight group: 60,001 to 70,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
2.1	Rock Island, Ill	Davenport, Iowa	50,003	50,000	2761.00	[illegible]	7.34	3.85	[illegible]	[illegible]	[illegible]	191	160	290	190
607	Virginia, Minn	Gary, Ind	60,962	60,000	64.68	2.59	15.72	14.11	16.48	18.08	18.10	111	95	87	87
2068	Oakland, Calif	Chicago, Ill	60,403	60,000	57.30	1.84	37.08	27.30	34.50	37.14	34.33	135	107	100	108

TABLE 91

Earnings, rates and costs for single-car movements originating in western territory

Actual weight group: 70,001 to 100,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
			Pounds	*Pounds*	*Cents*	*Cents*						*Percent*	*Percent*	*Percent*	*Percent*
15	El Paso, Tex	Vinton, Tex	75,200	50,000	1387.50	36.90	$5.90	$3.62	$4.48	$4.28	$4.74	163	132	138	124
37	Kewaunee, Wis	Green Bay, Wis	88,687	85,120	275.14	6.34	2.73	3.06	3.74	3.54	3.95	89	73	77	69
51.6	San Jose, Calif	Richmond, Calif	80,000	80,000	308.88	7.72	3.80	3.88	4.82	4.60	5.05	98	79	83	75
56	do	do	99,200	80,000	300.00	6.04	3.39	4.78	5.76	5.39	6.26	71	59	63	54
58.8	Fairline, Minn	Duluth, Minn	91,500	75,000	309.52	5.73	3.97	3.17	3.92	3.70	4.08	125	101	107	97
76.9	Sacramento, Calif	Richmond, Calif	94,000	45,000	340.70	7.25	5.60	3.62	4.66	4.32	4.75	155	120	130	118
94.7	Davenport, Iowa	Peoria, Ill	73,760	85,000	238.86	6.07	8.39	4.25	5.08	5.02	5.46	198	165	167	153
98.6	Fort Scott, Kans	Kansas City, Mo	76,400	75,000	228.16	5.80	5.75	4.05	4.91	4.80	5.22	142	117	120	110
110.6	Tulsa, Okla	Joplin, Mo	100,000	100,000	231.07	4.60	5.50	3.44	4.36	4.08	4.44	160	126	135	124
124.4	Oklahoma City, Okla	Sand Springs, Okla	89,887	100,000	188.5	4.20	5.24	3.80	4.75	4.55	4.82	138	110	115	107
132.1	Ada, Okla	do	94,880	100,000	198.82	4.19	5.48	3.70	4.65	4.42	4.77	148	118	124	115
146.8	Dallas, Tex	Bond, Tex	97,850	100,000	191.41	3.91	5.75	5.23	6.25	5.97	6.75	110	92	96	85
172.5	Miami, Okla	Kansas City, Mo	80,000	100,000	146.08	3.40	6.29	4.61	5.68	5.55	5.85	136	111	113	108
176.7	Cape Girardeau, Mo	Newport, Ark	95,200	99,904	157.57	3.28	6.03	4.02	5.11	4.88	5.19	150	118	124	116
184.4	Wisconsin Rapids, Wis	Milwaukee, Wis	89,600	75,000	146.42	3.25	6.03	4.75	6.09	5.78	6.22	127	99	104	97
192.7	Springfield, Mo	Sand Springs, Okla	95,488	100,000	155.88	3.30	6.29	4.14	5.27	5.02	5.34	152	119	125	118
200.4	Lake Charles, La	Houston, Tex	87,504	99,904	123.32	2.80	6.03	4.56	5.74	5.57	5.90	132	105	108	102
230	Waco, Tex	do	96,078	49,887	132.35	2.76	11.81	4.43	5.69	5.43	5.72	267	208	217	206
258	Grand Junction, Colo	Geneva, Utah	73,400	80,000	154.15	3.84	9.95	6.28	7.83	7.78	8.22	158	127	128	121
269	Two Rivers, Wis	Indiana Harbor, Ind	92,084	90,048	89.38	1.94	5.22	6.04	7.44	7.23	7.72	86	70	72	68
271	Albuquerque, N. Mex	Vinton, Tex	89,600	80,000	147.23	3.28	8.90	5.43	7.02	6.70	7.11	164	127	133	125
276	Woody Creek, Colo	Minnequa, Colo	74,000	50,000	135.04	3.30	9.18	6.35	7.96	7.90	8.32	145	115	116	110
285.8	Alton, Ill	Newport, Ark	94,070	99,904	127.89	2.72	7.85	5.18	6.47	6.27	6.77	152	121	125	117
297	Sedalia, Mo	Kansas City, Mo	80,998	74,995	82.49	2.06	4.72	5.62	7.04	6.99	7.25	84	67	68	65
360	Anoka, Minn	Sterling, Ill	92,084	112,000	134.72	2.92	9.31	6.01	7.85	7.49	7.87	155	119	124	118
384	Wausau, Wis	Gary, Ind	99,094	99,994	113.32	2.27	8.25	6.32	7.89	7.87	8.10	131	105	106	102
430.4	Benton, Ark	Longview, Tex	95,752	99,904	78.61	1.70	7.34	6.75	8.58	8.29	8.71	109	86	89	84
493.4	Kansas City, Mo	Chicago, Ill	92,200	99,994	118.80	2.54	11.53	7.03	9.25	8.87	9.21	164	125	130	125
630.6	Fort Smith, Ark	Houston, Tex	72,000	99,904	72.81	2.02	11.53	11.25	13.61	13.96	14.49	103	85	83	80

TABLE 92

Actual weight group: 100,001 to 120,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
10	St. Louis, Mo	Granite City, Ill	112,224	Min. 117.29 per car	1222.40	21.83	2.18	2.58	3.22	2.92	3.27	84	68	75	67
10.8	Oakland, Calif	Richmond, Calif	102,000	Min. 88.58 per car	1203.70	25.59	2.55	2.69	3.53	3.16	3.52	95	72	81	72
11.5	Colton, Calif	Kaiser, Calif	118,000	80,000	460.86	14.84	1.70	2.40	3.25	2.82	3.14	71	52	60	54
16	Los Angeles, Calif	Torrance, Calif	114,000	100,000	881.25	15.48	2.60	2.48	3.35	2.92	3.25	105	78	89	80
19	Minneapolis and Minnesota Transfer, Minn.	Newport, Minn	111,552	-------	596.32	10.65	113.30 per car	2.56	3.43	3.01	3.35	79	59	67	61
26	Anoka, Minn	St. Paul, Minn	111,833	112,000	458.98	6.20	1.87	2.64	3.54	3.11	3.46	71	53	60	54
33	St. Louis, Mo	Federal, Ill	127,804	76,400	577.81	6.03	2.98	2.55	3.26	2.90	3.23	117	91	103	92
45.6	Los Angeles, Calif	Kaiser, Calif	120,000	80,000	429.82	7.16	3.40	2.66	3.60	3.13	3.48	128	94	109	98
48	Galveston, Tex	Houston, Tex	110,729	149,990	418.75	7.61	3.20	2.58	3.31	3.01	3.34	124	97	106	96
53.2	Boracher Junction, Minn	Duluth, Minn	110,000	75,000	343.98	6.25	3.87	2.66	3.39	3.09	3.43	145	117	128	116
57	Rivera, Calif	Kaiser, Calif	130,000	60,000	304.21	5.91	3.40	2.59	3.57	3.05	3.39	131	95	111	100
62.7	St. Joseph, Mo	Kansas City, Mo	115,452	112,000	348.23	6.31	3.99	3.02	4.02	3.58	3.98	132	99	111	101
75	Ogden, Utah	Geneva, Utah	158,800	100,000	304.37	5.63	4.27	3.19	4.22	3.78	4.17	134	101	113	102
76.3	Mountain Iron, Minn	Duluth, Minn	120,000	75,000	324.72	5.22	5.25	2.68	3.48	3.12	3.46	196	151	168	152
84.2	Milwaukee, Wis	Chicago, Ill	118,400	60,010	282.85	4.88	4.09	2.81	3.63	3.28	3.63	146	113	124	113
85.3	do	do	118,048	60,001	282.97	4.83	4.09	3.08	4.16	3.65	4.03	133	99	112	101
114.7	Ely, Minn	Duluth, Minn	104,000	75,000	252.83	4.88	5.80	3.30	4.23	3.81	4.26	170	133	145	131
121	Denver, Colo	Minnequa, Colo	104,540	100,000	208.28	3.98	4.82	3.74	4.90	4.47	4.89	129	98	108	99
121.5	La Crosse, Wis	Newport, Minn	104,384	99,904	281.51	5.41	6.55	3.75	4.91	4.40	4.91	175	133	149	133
121.7	Chillicothe, Mo	Kansas City, Mo	120,656	112,000	239.78	4.34	5.22	3.58	4.74	4.27	4.68	146	110	112	112
127.5	Burlington, Iowa	Sterling, Ill	116,010	56,000	269.51	4.64	6.10	3.48	4.66	4.15	4.58	175	130	147	133
136.1	Green Bay, Wis	Milwaukee, Wis	116,480	112,000	197.76	3.41	4.55	3.14	4.10	3.73	4.05	145	111	122	112
137	Parsons, Kans	Kansas City, Mo	108,909	55,341	278.10	5.13	5.38	3.33	4.30	3.97	4.35	162	125	136	125
138.8	Madison, Wis	Chicago, Ill	129,472	90,001	253.11	3.89	5.45	3.26	4.48	3.89	4.27	167	122	140	128

TABLE 97—Continued

Earnings, value and costs for single-car movements originating in western territory—Continued

Actual weight group: 100,001 to 130,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
			Pounds	Pounds	Cents	Cents						Percent	Percent	Percent	Percent
191	Green Bay, Wis	Milwaukee, Wis	106,111	90,000	167.20	3.16	$6.55	$4.14	$5.13	$4.81	$5.35	110	89	95	85
147.8	Duluth, Minn	St. Paul, Minn	119,952	112,000	194.07	3.29	6.55	3.52	4.78	4.21	4.81	129	98	108	99
149.8	Sheboygan, Wis	Chicago, Ill	116,400	112,000	244.38	4.21	8.78	3.25	4.23	3.87	4.19	194	148	163	150
166	Lake, Wis	Gary, Ind	117,000	60,032	137.95	2.46	6.09	4.60	5.83	5.39	5.92	89	70	76	69
176	Milwaukee, Wis	So. Chicago, Ill	114,240	60,032	132.72	2.33	4.99	4.62	5.88	5.42	5.95	89	70	75	69
176	St. Louis, Mo	Peoria, Ill	120,512	56,000	284.11	4.40	7.72	3.77	6.04	4.50	4.78	205	156	171	161
178.8	Milwaukee, Wis	Sterling, Ill	116,400	112,000	142.72	2.46	6.38	3.46	6.53	4.13	4.44	127	97	108	99
181	Fresno, Calif	Richmond, Calif	108,000	80,000	199.47	3.76	7.20	4.10	5.55	5.06	5.49	172	130	142	131
192.5	Springfield, Mo	Kansas City, Mo	127,150	100,000	224.41	3.50	8.80	3.25	6.42	3.95	4.25	207	154	172	160
200.4	La Crosse, Wis	Sterling, Ill	122,578	112,000	202.09	3.29	8.55	3.88	5.10	4.59	4.98	172	126	143	132
217	Cedar Rapids, Wis	Chicago, Ill	116,460	112,000	203.93	3.52	7.60	3.69	6.00	4.47	4.76	206	155	170	160
230.8	Des Moines, Iowa	Sterling, Ill	116,400	112,000	191.73	3.31	7.60	3.78	5.02	4.59	4.88	201	151	166	156
231	Green Bay, Wis	Chicago, Ill	126,327	90,000	138.23	2.19	5.22	4.15	5.30	4.89	5.35	126	97	107	98
234.6	Newton, Iowa	Peoria, Ill	109,559	112,000	176.74	3.23	7.60	3.98	5.74	4.86	5.15	190	145	158	148
235	Fond Du Lac, Wis	So. Chicago, Ill	118,720	89,824	114.03	1.93	4.97	4.68	5.97	5.59	5.98	106	83	90	83
240	Fargo, N.D	St. Paul, Minn	112,560	112,000	175.08	3.11	7.60	4.33	5.83	5.27	5.67	176	130	144	134
243.3	Ada, Okla	Joplin, Mo	112,000	100,000	170.16	3.00	7.34	3.93	5.23	4.81	5.10	186	140	153	144
267	Greenville, Tex	Sand Springs, Okla	107,318	99,994	60.02	1.27	7.93	4.08	8.32	5.94	6.42	159	125	134	124
278.8	Durant, Okla	Longview, Tex	102,368	99,904	112.98	2.23	8.28	5.26	8.83	6.30	5.79	119	95	100	93
279.3	La Crosse, Wis	Chicago, Ill	117,152	112,000	130.14	2.21	8.21	4.46	8.07	5.45	5.94	139	102	114	108
282.5	Wichita, Kans	Sand Springs, Okla	104,244	100,000	116.10	2.20	8.29	4.49	5.00	5.52	5.80	140	107	114	108
288.9	Hastings, Nebr	Kansas City, Mo	128,000	112,000	163.42	3.58	7.85	4.32	5.08	5.26	5.65	182	131	148	139
308	Cushing, Okla	Sand Springs, Okla	121,094	99,994	46.97	0.77	4.49	4.78	8.25	5.73	6.18	94	72	78	73
310.5	Eau Claire, Wis	Chicago, Ill	116,460	112,000	116.39	2.01	8.21	4.31	5.77	5.30	5.56	144	108	117	112
316	McAlester, Okla	Kansas City, Mo	127,904	99,994	166.77	2.61	7.11	4.05	5.53	4.98	5.22	176	129	143	136
328	Fort Worth, Tex	Houston, Tex	129,000	49,987	163.11	2.51	12.81	4.08	5.60	5.00	5.27	314	229	256	243
332	Jamestown, N.D	St. Paul, Minn	122,685	112,000	160.01	2.61	8.78	4.65	8.42	5.70	6.09	189	137	154	144
340.8	Minneapolis, Minn	Milwaukee, Wis	116,480	112,000	149.99	2.59	8.78	4.51	8.06	5.56	5.82	195	145	158	151
364	Waterloo, Iowa	Indiana Harbor, Ind	112,000	112,000	120.74	2.16	7.85	5.74	7.40	6.93	7.35	137	108	113	107
387	Oelwein, Iowa	So. Chicago, Ill	129,920	112,000	124.33	1.91	7.60	5.32	7.07	6.41	6.92	143	107	119	111
407.5	Minneapolis, Minn	Sterling, Ill	116,400	112,000	132.97	2.29	8.31	4.95	8.69	6.16	6.39	168	139	151	148
409.4	North Lake, Mich	So. Chicago, Ill	119,123	90,048	110.54	1.86	7.60	6.00	8.72	8.15	6.83	110	87	93	88
444.5	Tulsa, Okla	Bond, Tex	100,359	100,000	90.53	1.97	8.73	7.28	8.13	8.78	9.40	120	96	99	93
524	E. St. Louis, Ill	Kansas City, Mo	118,400	112,000	71.37	1.21	8.45	5.66	7.73	7.09	7.29	114	93	91	88
529	Mountain Iron, Minn	Chicago, Ill	125,900	112,000	130.51	2.21	11.73	6.03	8.12	7.40	7.78	195	144	158	151
575.6	St. Louis, Mo	Longview, Tex	100,000	99,904	106.05	2.14	12.03	7.49	8.71	9.32	9.44	171	132	138	133
582.5	Woonsocket, S.D	Milwaukee, Wis	128,576	112,000	131.65	2.06	11.93	6.06	8.54	7.55	7.94	197	140	158	150
609	St. Paul, Minn	Federal, Ill	110,080	89,827	78.76	1.43	8.65	7.56	9.93	9.35	9.87	115	87	93	89
614	Chisholm, Minn	Indiana Harbor, Ind	112,000	112,000	103.83	1.85	11.38	8.53	11.04	10.46	10.87	134	103	109	105
758.4	Tulsa, Okla	Swan, Tex	129,248	99,904	73.90	1.16	8.90	7.54	10.41	9.38	9.90	118	85	95	91
1151	Minneapolis, Minn	Minnequa, Colo	120,960	112,000	91.78	1.78	10.59	10.19	14.29	12.78	13.35	161	115	128	123

TABLE 98

Actual weight group: 130,001 to 150,000 pounds

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
18	Dominguez, Calif	Torrance, Calif	135,000	100,000	1066.75	15.85	2.60	2.14	3.00	2.51	2.80	121	87	104	93
136	Rockford, Ill	Indiana Harbor, Ind	147,840	112,000	722.26	5.00	4.09	3.03	3.94	3.49	3.89	135	104	117	105
143.7	Steelton, Minn	St. Paul, Minn	136,000	100,800	217.81	3.25	4.68	3.58	4.69	4.15	4.68	131	100	113	100
175.4	Des Moines, Iowa	Davenport, Iowa	139,815	112,000	249.71	3.55	6.51	2.97	4.05	3.53	3.83	221	162	186	171
182.4	Davenport, Iowa	Chicago, Ill	144,407	80,000	208.33	2.89	9.95	2.94	4.04	3.50	3.79	338	246	284	263
188.8	Emco, Minn	Brainerd, Minn	154,000	75,000	264.30	3.43	6.49	3.49	4.73	4.06	4.55	186	137	160	143
202.2	Worscher Junction, Minn	Minneapolis, Minn	131,300	75,000	262.11	3.97	8.09	4.00	5.28	4.60	4.85	202	153	173	163
221.7	Winona, Minn	Milwaukee, Wis	136,416	100,800	156.22	2.33	5.14	3.64	5.09	4.38	4.78	141	101	117	108
250.2	North Lake, Mich	Kohler, Wis	147,168	112,000	212.70	2.87	7.23	3.28	4.58	3.95	4.24	220	158	183	171
308.4	Wichita, Kans	Kansas City, Mo	134,233	112,000	162.87	2.18	6.55	3.86	5.32	4.72	4.99	170	123	138	131
355.8	Moline, Ill	do	134,624	112,000	159.45	2.37	8.78	4.49	6.32	5.49	5.88	196	139	160	149
372	Oklahoma City, Okla	Sand Springs, Okla	131,821	99,994	42.02	0.64	5.28	4.87	6.52	5.67	6.29	108	81	90	84
397.6	Fort Smith, Ark	Longview, Tex	143,138	99,904	144.86	2.03	8.38	4.73	6.45	5.69	6.11	177	130	147	137

TABLE 93—Continued

Earnings, rates and costs for single-car movements originating in western territory—Continued

Actual weight group: 130,001 to 160,000 pounds—Continued

Distance (actual miles) (1)	Origin (2)	Destination (3)	Average actual weight per car (4)	Minimum weight requirement (5)	Revenue per car-mile (6)	Revenue per ton-mile (7)	Rate per net ton (8)	Variable cost per net ton (9)	Fully allocated cost per net ton: Ton and ton-mile (10)	Fully allocated cost per net ton: Car and car-mile (11)	Fully allocated cost per net ton: Dollar basis (12)	Ratio of rate to variable costs (13)	Ratio of rate to fully allocated costs: Ton and ton-mile (14)	Ratio of rate to fully allocated costs: Car and car-mile (15)	Ratio of rate to fully allocated costs: Dollar basis (16)
			Pounds	Pounds	Cents	Cents						Percent	Percent	Percent	Percent
396	Waco, Tex	Sand Springs, Okla	142,276	90,096	91.31	1.29	$9.78	$4.75	$6.47	$5.72	$6.13	206	151	171	160
503	Wichita Falls, Tex	Houston, Tex	133,011	90,007	125.25	1.87	15.40	5.07	7.00	6.32	6.55	304	217	244	235
512	Iron Mountain, Mich	Newport, Minn	130,502	112,000	100.09	1.54	7.85	5.56	7.84	6.89	7.28	141	100	114	108
531	Kaiser, Calif	Richmond, Calif	134,000	100,000	129.72	1.85	9.81	5.57	7.91	6.91	7.30	176	124	142	134
550.3	Emco, Minn	Chicago, Ill	142,200	112,000	149.02	2.10	11.73	5.68	7.87	6.98	7.35	206	149	168	159
599.6	Escanaba, Mich	Newport, Minn	132,608	112,000	97.05	1.47	8.78	6.63	9.16	8.11	8.69	132	96	108	101
629.9	Paragould, Ark	Houston, Tex	140,224	90,904	136.03	1.94	12.83	6.70	9.08	8.12	8.65	191	141	158	148
636.1	St. Louis, Mo	Semo, Tex	132,728	90,904	135.45	2.05	13.36	6.96	9.38	8.48	9.01	191	142	158	148
649.2	North Lake, Mich	Waterloo, Iowa	135,811	112,000	118.61	1.74	11.34	7.20	9.64	8.70	9.30	158	118	130	122
843	Pittsburg, Calif	Geneva, Utah	145,500	100,000	127.04	1.76	14.81	6.13	11.36	9.90	10.85	182	130	150	139
1103.4	Houston, Tex	Davenport, Iowa	151,475	75,000	46.30	.61	21.00	8.97	12.82	11.24	11.57	235	163	188	182
1222	Geneva, Utah	Torrance, Calif	154,000	100,000	80.52	1.05	14.81	9.48	13.79	11.77	12.47	156	107	126	119

TABLE 94

Actual weight group: 160,001 to 180,000 pounds

508.3	Marshan Jct., Minn	Chicago, Ill	163,000	112,000	179.22	2.19	11.14	4.91	6.94	5.93	6.33	227	161	188	176

TABLE 95

Earnings, rates and costs for multiple-car movements originating in western territory

Actual weight group: 100,001 to 130,000 pounds

84.2	Milwaukee, Wis	Chicago, Ill	118,400	300 GT	252.59	4.35	3.65	1.98	2.80	2.45	2.55	184	130	149	143
149.8	Sheboygan, Wis	do	126,400	48.10 GT	193.00	3.33	4.97	2.41	3.42	3.04	3.11	206	145	163	160
294.3	Eau Claire, Wis	Milwaukee, Wis	118,400	100,000	132.82	2.29	5.57	3.03	4.31	3.87	3.92	184	129	144	142
362.8	Minneapolis, Minn	do	118,400	600 GT	138.54	2.30	8.11	3.68	5.23	4.73	4.74	220	155	171	171
407.5	do	Sterling, Ill	118,400	600 GT	115.07	2.00	8.11	4.12	5.88	5.33	5.31	197	138	152	153
469.2	Steelton, Minn	Chicago, Ill	120,000	600 GT	116.15	1.94	8.11	5.20	7.12	6.50	6.72	156	114	125	121
629	do	So. Chicago, Ill	120,004	600 GT	77.38	1.29	8.11	6.83	9.25	8.47	8.86	119	88	96	92

TABLE 96

Actual weight group: 130,001 to 160,000 pounds

85.3	Milwaukee, Wis	Chicago, Ill	137,506	300 GT	294.41	4.27	3.65	1.76	2.59	2.17	2.27	207	141	168	161

The variable and fully allotted costs set forth in tables 75 through 96 were based on the unit costs shown in *Rail Carload Cost Scales by Territories for the Year 1972*, Statement No. 1C1-72, prepared by the Commission's Cost and Valuation Section. In addition, the costs in these tables reflect an updating to a 1973 level based on the methods outlined in *Rail Carload Cost Scales by Territories as of January 1, 1958*, Statement No. 2-58.

Variable costs consist of: (1) the variable portions of freight operating expenses, rents, and taxes (excluding Federal income taxes), and (2) the variable portion of the "cost of capital," excluding any allowance for Federal income taxes. Fully allocated costs consist of the variable costs plus an allocation of the constant costs which are composed of: (1) the constant portions of the freight operating expenses, rents, and taxes (excluding Federal income taxes), and (2) the constant, or remaining, portion of the "cost of capital."

When developing the fully allocated cost for a given movement, the variable cost (ultimately stated in cents per net ton for a comparison to the rate) is developed first and to this cost there is then added an allocation of the constant costs. For comparison purposes fully allocated costs are shown on three bases, with constant costs being allocated on the ton and ton-mile basis, the car and car-mile basis, and the dollar basis. To develop the constant unit costs per ton and per ton-mile and the constant unit costs per car and per car-mile, the dollar numerators, separated between those expenses and cost of capital not associated with distance (terminal) and those expenses and cost of capital associated with distance (line-haul), remain the same. However, the divisors change, that is, for the ton and ton-mile basis the tons originated and terminated, and the ton-miles were used for the respective terminal and line-haul elements; and for the car and car-mile basis the loaded cars and the loaded car-miles were used in a similar way. The constant unit costs for each of the two bases were then applied to the respective tons and ton-miles, and cars and car-miles, generated by a particular movement. The allocated constant costs thus obtained for each basis are converted to constant costs per net ton, which were then added to the variable cost per net ton to produce the fully allocated costs per net ton for each basis. For the dollar basis an allocation ratio was developed for each region by dividing the total regional variable and constant costs by that region's total variable costs. The variable cost per net ton for a given movement was then multiplied by the applicable regional ratio to produce the fully allocated cost per net ton.

The variable costs shown in tables 75 through 96 reflect adjustments to territorial average costs to recognize certain transportation characteristics indicated in the exhibits of record, including the actual route of movement miles and the actual or average actual lading weights. For costing purposes gondola general-service cars were used, and way and through costs were applied to the single- and multiple-car movements. In addition the following adjustments were made to the single-car and multiple-car movements.

For single-car movements, line-haul costs were adjusted by removing the interchange costs included in the territorial average costs on a loaded car-mile basis and substituting therefor the interchange cost per car interchanged and using the number of interchanges from the routings shown in exhibits of record. No adjustments were made to the terminal costs.

For multiple-car movements, terminal costs were adjusted by reducing the switching cost per carload by 50 percent at origin and destination, by reducing variable freight train car costs per carload by 50 percent at origin and destination, and by reducing station clerical costs per carload by assuming 75 percent of the cost as being associated with the car and 25 percent as being associated with the shipment. On multiple-car shipments where the number of cars per shipment was not shown nor could be determined, we assumed an average of between 5 and 10 cars per shipment. Line-haul costs were adjusted by removing the interchange costs included in the territorial average costs on a loaded car-mile basis and substituting therefor the interchange costs per car interchanged and using the number of interchanges from the routings shown in the exhibits of record.

We have also developed frequency distribution tables by type of movements, rate territories, and weight groups. These tables, attached as tables 99 through 116, shown the number of rate to cost ratios falling within ratio range groups of from below 95 percent to 230 percent and over, along with the composite simple average ratio for each column.

A total of 392 movements were costed out for scrap iron and steel from the exhibits of record. Of this total, 329 were costed out as single-car movements and the remaining 63 were costed out as multiple-car movements. The type of movements (single-car v. multiple-car) were indicated in the exhibits of record.

Results of revenue cost comparisons.—Of the total 392 movements shown in table 75 through 96, 40 movements had rate-to-variable-cost ratios below 100 percent. Under the ton and ton-mile method, 104 movements had rate-to-fully-allocated-cost ratios of less than 100 percent, while under the car and car-mile and dollar basis there were 79 and 99 movements, respectively, having ratios less than 100 percent. Viewed in another way, of the total 392 movements 10 percent failed to cover variable costs, whereas 27 percent failed to cover fully allocated costs using the ton and ton-mile basis of allocating constant costs and 20 percent and 25 percent of the rates failed to cover the fully allocated costs using the car and car-mile and dollar bases of allocating constant costs, respectively. (See part IV.)

As would be expected, the ton and ton-mile basis of allocating constant costs assigns a relatively larger portion of constant costs to the various movements; and, therefore, there is a relatively larger number of rate-to-fully-allocated-cost ratios below 100 percent on the ton and ton-mile basis than for the car and car-mile and dollar bases.

For the 329 *single-car movements,* 39 movements had rate-to-variable-cost ratios below 100 percent. Under the ton and ton-mile method, 97 of the 329 movements shown had rate-to-fully-allocated-cost ratios of less than 100 percent, while under the car and car-mile and dollar bases there were 76 and 95 movements, respectively, having ratios less than 100 percent. Viewing the results in terms of percentages, 12 percent failed to cover variable costs whereas 29 percent failed to cover allocated costs using the ton and ton-mile method of allocating constant costs and 23 percent and 29 percent of the rates failed to cover the fully allocated costs using the car and car-mile and dollar bases of allocating constant costs, respectively. Single-car movements as a whole had a composite simple average ratio of rate to variable costs of 155 percent. Under the ton and ton-mile, car and car-mile, and dollar bases the composite simple average ratios were 120 percent, 130 percent, and 121 percent, respectively.

For the 63 *multiple-car movements,* only 1 of these movements had a rate-to-variable-cost ratio of less than 100 percent, that is, only 1 rate was below variable costs. Of these 63 multiple-car movements, 29 had a rate-to-variable-costs ratio between 180 and 229 percent and 8 over 230 percent. On a ton and ton-mile basis seven movements had a rate-to-fully-allocated-cost ratio of less than 100 percent, whereas three movements were below 100 percent on a car and car-mile basis and four movements on a dollar basis. Multiple-car movements as a whole had a composite simple average ratio of rate to variable of 183 percent. Under the ton and ton-mile, car and car-mile, and dollar bases, the composite simple average ratio was 131 percent, 146 percent, and 142 percent, respectively.

A comparison of the total 392 movements by originating territories, official, southern, and western, reveals the following: The number of rate-to-variable-cost ratios below 100 percent are evenly distributed between the three territories, with official and western territory each having 10 percent and the southern having 11 percent of the ratios below 100 percent. The number of rate-to-fully-allocated-costs ratios below 100 percent are also fairly well distributed between the three territories for the three bases of allocating constant costs.

These results are shown in table 97 below.

TABLE 97

Number and percent of movements of scrap iron and steel having revenues below variable and fully allocated costs, by origin territories and by type of shipment[1]

	Total U.S. (2)	Official (3)	Southern (4)	Western (5)
Total movements				
Single car	329	138	68	123
Multiple car	63	36	19	8
Total	392	174	87	131

	Number (a)	Percent (b)	Number (a)	Percent (b)	Number (a)	Percent (b)	Number (a)	Percent (b)
Movements with revenues below variable costs								
Single car	39	12	17	12	9	13	13	11
Multiple car	1	2	0	0	1	5	0	0
Total	40	10	17	10	10	11	13	10
Movements with revenues below fully allocated costs								
Ton & ton-mile basis								
Single car	97	29	39	28	18	26	40	33
Multiple car	7	11	5	14	1	5	1	13
Total	104	27	44	25	19	22	41	31

Number and percent of movements of scrap iron and steel having revenues below variable and fully allocated costs, by origin territories and by type of shipment[1]—Continued

	Number (a)	Percent (b)	Number (a)	Percent (b)	Number (a)	Percent (b)	Number (a)	Percent (b)
Car & car-mile basis								
Single car	76	23	33	24	17	25	26	21
Multiple car	3	5	1	3	1	5	1	13
Total	79	20	34	20	18	21	27	21
Dollar basis								
Single car	95	29	38	28	20	29	37	30
Multiple car	4	6	1	3	2	11	1	13
Total	99	25	39	22	22	25	38	29

[1] Movements based on those provided by the railroads. Costs developed by the Commission's cost and valuation section utilizing adjusted territorial average costs from I.C.C. Statement No. ICI-72, *Rail Carload Cost Scales 1972.*

A comparison of the data by type of movement and originating region reveals the following. The number of rate-to-variable cost ratios below 100 percent on single-car movements is evenly distributed between the three territories, official, southern, and western, with 12 percent, 13 percent, and 11 percent of the rates below variable cost, respectively. However, in the case of multiple-car movements, the official and western territory had no rates below variable costs whereas in the southern territory 5 percent of the rates were below variable costs.

Turning to the various weight groupings by type of movement, it can be seen in table 98 below that percentagewise, the number of rates exceeding variable and fully allocated cost increases at the higher weight groups.

TABLE 98

Number and percent of representative movements having revenues below their variable and fully allocated costs by weight groups[1]

Weight group	Total number of movements in each weight group	Number & percent of movements having:							
		Revenues below variable cost		Revenues below fully-allocated costs					
				Ton & ton-mile		Car & car-mile		Dollar	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
40,000-70,000	15	5	33	10	67	11	73	12	80
70,000-100,000	70	9	13	21	30	20	29	23	33
100,001-130,000	215	21	10	57	27	38	18	52	24
130,001-160,000	89	5	6	15	17	10	11	12	13
160,001-190,000	3	0	0	1	33	0	0	0	0
Total	392	40	10	104	27	79	20	99	25

---

[1] Movements based on those provided by the railroads. Costs developed by the Commission's cost and valuation section utilizing adjusted territorial average costs from ICC Statement No. 1C1-72, *Rail Carload Cost Scales 1972.*

Generally, for both the single-car and multiple-car scrap movements, the short-haul movements have lower revenue/cost ratios than do the longer movements. See part II (B), *infra.*

It should be observed that, although costs have been developed for the representative movements, there is no indication in the record as to the annual volume of traffic moving under the applicable rates. Without that information the compensatory nature of the entire rate structure cannot be determined.

In addition, several parties have submitted evidence of cost of service for scrap and iron ore movements along with cost-commodity rate/cost comparisons. An analysis of these cost data will be presented in other sections of this report.

TABLE 99

Frequency distribution of total movements

(Scrap iron and steel)

All weight groups

Ratio range (percent)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis	Car and car-mile basis	Dollar basis
(1)	(2)	(3)	(4)	(5)
Below 95	33	78	65	83
95-99	7	26	14	16
100-109	18	31	26	40
110-119	19	44	45	43
120-129	23	59	38	47
130-139	35	49	41	38
140-149	31	35	43	37
150-159	40	28	34	29
160-169	29	15	28	20
170-179	31	8	20	8
180-230	94	17	31	25
231 and over	32	2	7	6
Total	392	392	392	392
Simple average ratio	160	122	133	124

TABLE 100

Frequency distribution of single car movements

(Scrap iron and steel)

All weight groups

Ratio range (percent)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis	Car and car-mile basis	Dollar basis
(1)	(2)	(3)	(4)	(5)
Below 95	32	74	63	80
95-99	7	23	13	15
100-109	17	24	21	35
110-119	18	39	39	37
120-129	23	47	32	40
130-139	29	43	35	35
140-149	27	24	37	25
150-159	35	22	24	21
160-169	24	10	21	12
170-179	28	5	14	5
180-230	65	16	23	18
231 and over	24	2	7	6
Total	329	329	329	329
Simple average ratio	155	120	130	121

TABLE 101

Frequency distribution of single car movements

(Scrap iron and steel)

Official territory-all weight groups

Ratio range (percent) (1)	Number of rate-to-cost ratios			
	Rate to variable costs (2)	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis (3)	Car and car-mile basis (4)	Dollar basis (5)
Below 95	13	34	27	34
95-99	4	5	6	4
100-109	10	4	2	12
110-119	7	19	14	13
120-129	6	21	15	22
130-139	12	17	15	12
140-149	8	8	17	11
150-159	17	10	9	6
160-169	13	3	6	6
170-179	9	3	7	1
180-230	22	13	16	14
231 and over	17	1	4	3
Total	138	138	138	138
Simple average ratio	158	124	135	125

TABLE 102

Frequency distribution of single car movements

(Scrap iron and steel)

Southern territory-all weight groups

Ratio range (percent) (1)	Number of rate-to-cost ratios			
	Rate to variable costs (2)	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis (3)	Car and car-mile basis (4)	Dollar basis (5)
Below 95	7	13	14	17
95-99	2	5	3	3
100-109	2	4	3	5
110-119	2	6	8	9
120-129	7	13	5	8
130-139	2	12	10	10
140-149	7	7	9	5
150-159	9	4	5	7
160-169	4	2	7	1
170-179	8	2	2	1
180-230	16	0	2	2
231 and over	2	0	0	0
Total	68	68	68	68
Simple average ratio	151	118	125	117

TABLE 103

Frequency distribution of single car movements

(Scrap iron and steel)

Western-all weight groups

Ratio range (percent) (1)	Number of rate-to-cost ratios			
	Rate to variable costs (2)	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis (3)	Car and car-mile basis (4)	Dollar basis (5)
Below 95	12	27	22	29
95-99	1	13	4	8
100-109	5	16	16	18
110-119	9	14	17	15
120-129	10	13	12	10
130-139	15	14	10	13
140-149	12	9	11	9
150-159	9	8	10	8
160-169	7	5	8	5
170-179	11	0	5	3
180-230	27	3	5	2
231 and over	5	1	3	3
Total	123	123	123	123
Simple average ratio	154	117	127	119

TABLE 104

Frequency distribution of single car movements

(Scrap iron and steel)

Weight group 40,000 to 70,000 pounds

Ratio range (percent) (1)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
	(2)	Ton and ton-mile basis (3)	Car and car-mile basis (4)	Dollar basis (5)
Below 95	5	8	10	11
95-99	0	2	1	1
100-109	3	3	2	1
110-119	2	0	0	1
120-129	2	0	1	0
130-139	1	1	0	0
140-149	0	0	0	1
150-159	1	0	0	0
160-169	0	1	1	0
170-179	0	0	0	0
180-230	1	0	0	0
231 and over	0	0	0	0
Total	15	15	15	15
Simple average ratio	106	91	86	82

TABLE 105

Frequency distribution of single car movements

(Scrap iron and steel)

Weight group 70,001 to 100,000 pounds

Ratio range (percent) (1)	Number of rate-to-cost ratios			
	Rate to variable costs (2)	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis (3)	Car and car-mile basis (4)	Dollar basis (5)
Below 95	7	18	15	19
95-99	2	3	5	3
100-109	5	4	4	12
110-119	3	16	13	13
120-129	5	12	9	8
130-139	10	5	10	4
140-149	8	3	4	2
150-159	10	1	1	2
160-169	6	2	3	1
170-179	3	0	0	0
180-230	5	1	1	1
231 and over	1	0	0	0
Total	65	65	65	65
Simple average ratio	139	111	114	107

TABLE 106

Frequency distribution of single car movements

(Scrap iron and steel)

100,001 to 130,000 pounds

Ratio range (percent)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis	Car and car-mile basis	Dollar basis
(1)	(2)	(3)	(4)	(5)
Below 95	17	37	29	39
95-99	3	15	6	10
100-109	5	11	13	15
110-119	12	20	19	20
120-129	13	28	20	27
130-139	14	27	19	22
140-149	15	14	27	13
150-159	19	12	14	13
160-169	15	3	12	6
170-179	20	0	6	2
180-230	34	5	5	3
231 and over	5	0	2	2
Total	172	172	172	172
Simple average ratio	152	117	128	118

TABLE 107

Frequency distribution of single car movements

(Scrap iron and steel)

Weight group 130,001 to 160,000 pounds

Ratio range (percent)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis	Car and car-mile basis	Dollar basis
(1)	(2)	(3)	(4)	(5)
Below 95	3	11	9	11
95-99	2	3	1	1
100-109	4	6	2	7
110-119	1	3	7	3
120-129	3	7	2	5
130-139	4	10	6	9
140-149	4	7	6	9
150-159	5	9	9	6
160-169	3	3	5	5
170-179	5	4	8	2
180-230	23	10	15	13
231 and over	18	2	5	4
Total	75	75	75	75
Simple average ratio	186	138	156	145

TABLE 108

Frequency distribution of single car movements

(Scrap iron and steel)

Weight group 160,001-190,000

Ratio range (percent) (1)	Number of rate-to-cost ratios: Rate to variable costs (2)	Rate-to-fully-allocated costs (Constant costs distributed on): Ton and ton-mile basis (3)	Car and car-mile basis (4)	Dollar basis (5)
Below 95	0	0	0	0
95-99	0	0	0	0
100-109	0	0	0	0
110-119	0	0	0	0
120-129	0	0	0	0
130-139	0	0	0	0
140-149	0	0	0	0
150-159	0	0	0	0
160-169	0	1	0	0
170-179	0	1	0	1
180-230	1	0	2	1
231 and over	1	0	0	0
Total	2	2	2	2
Simple average ratio	232	166	194	1[illegible]

TABLE 109

Frequency distribution of multiple car movements

(Scrap iron and steel)

All weight groups

Ratio range (percent)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis	Car and car-mile basis	Dollar basis
(1)	(2)	(3)	(4)	(5)
Below 95	1	4	2	3
95-99	0	3	1	1
100-109	1	7	5	5
110-119	1	5	6	6
120-129	0	12	6	7
130-139	6	6	6	3
140-149	4	11	6	12
150-159	5	6	10	8
160-169	5	5	7	8
170-179	3	3	6	3
180-230	29	1	8	7
231 and over	8	0	0	0
Total	63	63	63	63
Simple average ratio	183	131	146	142

TABLE 110

Frequency distribution of multiple car movements

(Scrap iron and steel)

Official territory-all weight groups

Ratio range (percent) (1)	Number of rate-to-cost ratios			
	Rate to variable costs (2)	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis (3)	Car and car-mile basis (4)	Dollar basis (5)
Below 95	0	2	1	1
95-99	0	3	0	0
100-109	1	2	2	4
110-119	0	2	3	2
120-129	0	8	3	4
130-139	4	3	5	2
140-149	2	7	2	7
150-159	2	2	7	6
160-169	3	3	4	3
170-179	2	3	2	1
180-230	16	1	7	6
231 and over	6	0	0	0
Total	36	36	36	36
Simple average ratio	186	134	151	146

TABLE 111

Frequency distribution of multiple car movements

(Scrap iron and steel)

Southern territory-all weight groups

Ratio range (percent)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis	Car and car-mile basis	Dollar basis
(1)	(2)	(3)	(4)	(5)
Below 95	1	1	1	1
95-99	0	0	0	1
100-109	0	5	3	1
110-119	0	2	3	4
120-129	0	3	2	2
130-139	2	1	1	1
140-149	2	2	2	3
150-159	2	3	2	1
160-169	2	2	1	3
170-179	1	0	3	1
180-230	7	0	1	1
231 and over	2	0	0	0
Total	19	19	19	19
Simple average ratio	175	126	136	134

TABLE 112

Frequency distribution of multiple car movements

(Scrap iron and steel)

Western territory-all weight groups

Ratio range (percent)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis	Car and car-mile basis	Dollar basis
(1)	(2)	(3)	(4)	(5)
Below 95	0	1	0	1
95-99	0	0	1	0
100-109	0	0	0	0
110-119	1	1	0	0
120-129	0	1	1	1
130-139	0	2	0	0
140-149	0	2	2	2
150-159	1	1	1	1
160-169	0	0	2	2
170-179	0	0	1	1
180-230	6	0	0	0
231 and over	0	0	0	0
Total	8	8	8	8
Simple average ratio	184	130	146	143

TABLE 113

Frequency distribution of multiple car movements

(Scrap iron and steel)

Weight group 70,001 to 100,000 pounds

Ratio range (percent)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis	Car and car-mile basis	Dollar basis
(1)	(2)	(3)	(4)	(5)
Below 95	0	0	0	0
95-99	0	0	0	1
100-109	0	2	2	1
110-119	0	0	0	0
120-129	0	2	0	0
130-139	2	0	2	2
140-149	0	1	0	1
150-159	0	0	1	0
160-169	0	0	0	0
170-179	2	0	0	0
180-230	1	0	0	0
231 and over	0	0	0	0
Total	5	5	5	5
Simple average ratio	61	120	125	125

TABLE 114

Frequency distribution of multiple car movements

(Scrap iron and steel)

Weight group 100,001 to 130,000 pounds

Ratio range (percent) (1)	Number of rate-to-cost ratios			
	Rate to variable costs (2)	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis (3)	Car and car-mile basis (4)	Dollar basis (5)
Below 95	1	3	2	3
95-99	0	2	1	0
100-109	1	5	3	3
110-119	1	5	5	5
120-129	0	7	5	7
130-139	3	6	4	1
140-149	3	6	4	8
150-159	5	6	8	6
160-169	5	2	4	6
170-179	1	1	5	2
180-230	20	0	2	2
231 and over	3	0	0	0
Total	43	43	43	43
Simple average ratio	177	128	141	137

TABLE 115

Frequency distribution of multiple car movements

(Scrap iron and steel)

Weight group 130,001 to 160,000 pounds

Ratio range (percent) (1)	Number of rate-to-cost ratios			
	Rate to variable costs (2)	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis (3)	Car and car-mile basis (4)	Dollar basis (5)
Below 95	0	0	0	0
95-99	0	1	0	0
100-109	0	0	0	1
110-119	0	0	1	0
120-129	0	3	0	0
130-139	1	0	0	0
140-149	0	4	2	3
150-159	0	0	1	2
160-169	0	3	3	2
170-179	0	2	1	1
180-230	8	1	6	5
231 and over	5	0	0	0
Total	14	14	14	14
Simple average ratio	211	148	172	166

TABLE 116

Frequency distribution of multiple car movements

(Scrap iron and steel)

Weight group 160,001 to 190,000 pounds

Ratio range (percent)	Number of rate-to-cost ratios			
	Rate to variable costs	Rate-to-fully-allocated costs (Constant costs distributed on)		
		Ton and ton-mile basis	Car and car-mile basis	Dollar basis
(1)	(2)	(3)	(4)	(5)
Below 95	0	1	0	0
95-99	0	0	0	0
100-109	0	0	0	0
110-119	0	0	0	1
120-129	0	0	1	0
130-139	0	0	0	0
140-149	1	0	0	0
150-159	0	0	0	0
160-169	0	0	0	0
170-179	0	0	0	0
180-230	0	0	0	0
231 and over	0	0	0	0
Total	1	1	1	1
Simple average ratio	143	90	120	113

Part I(D)(4): Analysis of other cost evidence

This section will focus upon an analysis of the cost evidence submitted by the parties, i.e., the revenue contribution of scrap iron and steel and the intercommodity rate and revenue/cost relationship between scrap and iron ores. On part II(B) we will continue our intercommodity analysis and will incorporate the results of the Coordinator's computation of variable and fully allocated costs presented in part I(D)(3) on scrap and iron ore (see Ex Parte No. 270 (Sub-No. 5)) for representative movements as furnished by the parties in this proceeding.

A total of 15 numbered verified opening statements were submitted in this proceeding by the various railroads, shippers, and consumer interests. Of these statements, only three include

best copy available

evidence of cost of service. Statements containing cost evidence were submitted on behalf of ISIS, the EPA, and the Southern Railway System (Southern).

RAILROADS, SHIPPERS AND CONSUMER INTERESTS COST EVIDENCE, REBUTTAL AND SURREBUTTAL EVIDENCE AND COMMENTS

Verified Statement Number 10

Verified Statement Number 10 was submitted on behalf of ISIS (or consultant). This party engaged a consulting firm (Moshman Associates, Inc.) to determine the revenue contribution of scrap as well as the intercommodity rate and revenue/cost relationship between scrap v. iron ore.

A. *Development of traffic data.*—The cost presentation in Verified Statement No. 10 was based on traffic data taken from the 1972 Carload Waybill Sample prepared by the Federal Railroad Administration. The data contained in the 1972 waybill file was computer processed to arrive at a distribution of traffic by destination territory and average length of haul. The latter was categorized into seven "mileage blocks," the first six each covering increments of 50 miles, i.e., 1 to 300 miles, and the last block containing traffic moving in excess of 300 miles. The territorial breakdown was reportedly based on the Commission's so-called "five rate territories," official, southern, western trunkline, southwest, and mountain Pacific territory.

The consultant's examination of the 1972 waybill tape revealed 4,487 waybills for scrap and 5,586 waybills for the iron ore commodities. As a result of errors in the waybill computer tape, in the form of blanks and zeroes, approximately 10 percent of the records for iron ore commodities 10111, 10112, and 10113 and for ferrous scrap commodity 40211 was excluded from consultant's analysis.

The prepondence of the traffic, both scrap and iron ore, was found to have moved in official territory. For example, over one-half of the iron ore traffic and almost three-quarters of the scrap traffic was shown to have terminated in official territory. Approximately 62 percent of the scrap traffic in official territory moved less than 100 miles and only 8 percent moved more than 300 miles. Conversely, about 25 percent of the iron ore traffic in official territory moved distances of up to 100, 150, and 200 miles, respectively, with 22.8 percent of the iron ore waybills representing traffic in the other four distance blocks or over 200 miles.

The pattern for iron ore traffic was found to be similar in other destination territories except in the southern and southwest. In the southwest territory all iron ore traffic moved more than 300 miles and in the southern, 50 percent of the iron ore traffic moved between 201 and 250 miles and approximately 25 percent between 251 and 300 miles. In comparison, scrap traffic in other territories was shown to be distributed mainly in the shortest and longest rather than the middle mileage blocks with the exception of in the southern where the traffic tapered off as the mileages increased.

The consultant also made a comparison between the 1969 and 1972 waybill tapes of the average distance moved for each of the two commodities to each of the five destination territories. This comparison disclosed that based on short-line miles the average haul for iron ore between 1969 and 1972 declined, whereas the average haul for scrap increased slightly.

The consultant also examined the relationship of multiple-car v. single-car movements by destination territory for 1972. This examination based on the 1972 waybill tape, excluding "bad data," indicated that 92.3 percent of all ore traffic moved in multiple-car shipments[14] in 1972. Conversely, only 7.5 percent of the sampled waybills for scrap traffic were multiple-car shipments.

B. *Development of rates and revenues.*—The consultant states it was unable to cite rate and tariff references due to the limitations of the waybill data. However, it was able to compute revenues per car and per ton based on the information contained in the 1969 and 1972 waybill files. From this information, the consultant made a comparison of average revenue and movement distance in each rate territory for scrap and iron ore for the years 1969 and 1972. The results of this comparison indicate that for iron ore the average miles per car between 1969 and 1972 had declined by 54 percent. This decline has been accompanied by an average revenue reduction per car of $18, a 10.3-percent decrease in per-car revenues. In comparison, the average movement distance between 1969 and 1972 for scrap has remained virtually unchanged, increasing only 1.4 percent. Further, the average revenue has risen $58 per car, a 24-percent increase.

The consultant notes the 1972 revenue exclude the increased rates on iron ore authorized in Ex Parte No. 281-B which became effective in October of 1973, and the interim increase permitted in Ex Parte No. 295. Therefore, in order to bring the 1972 revenue figures up to a September 1973 level as required by the Commission order of December 28, 1973, iron ore revenues for traffic between all territories were increased 5.575 percent. The revenues shown for scrap were not increased since neither rate increase applied at the time to scrap. When a comparison is made between rail revenues for scrap and iron ore, at the constructed September 1973 level, the revenues on scrap are significantly higher than for iron ore ranging from 137 percent on the car-mile basis to 260 percent on a per-ton basis.

---

[14] Multiple car in this instance refers to both multiple-car and trainload shipments.

A more detailed analysis of the 1972 traffic was made by the consultant based on a randomly selected sample drawn from the 1972 waybill tape. A minimum of 5 waybills were randomly selected for each of the first six mileage blocks and 10 waybills randomly selected for movements of more than 300 miles. These movements were further separated into three territories, east, south, and west, which the consultant contends relate to the Commission's established cost regions. In table 5 of the consultant's statement, the sample data are summarized for each mileage block and destination territory and all territories combined.

Based on this sample data, the consultant concludes the following:

(1) Average loadings for ore are higher than for scrap.

(2) The consultant shows that the revenue per car is consistently higher for the scrap hauls than for iron ore. For example, the revenue on scrap movements ranged from $42 per car to $331 per car higher than that shown on iron ore movements for the same mileage blocks and territories.

(3) Revenue per *ton* of scrap, for sample averages for which comparable ore data were available, ranged from a low of $3.43 to a high of $10.96 or from 166.5 percent to 219.2 percent of the comparable ore movements.

(4) Revenue per *car-mile* for scrap movements ranged from a low of $1.32 to a high of $7.24, as compared with their ore opposites of $0.88 to $3.80, the scrap revenue being from 150 percent to 190.5 percent higher than for iron ore.

(5) The comparative data for all scrap iron sample traffic were as follows:

TABLE 117

1972 waybill tape comparisons

Scrap	Absolute figure	As a percent of comparable data for iron ore
		Percent
Average miles/car	227	102.7
Average tons/car	56	67.4
Average revenue/car	$395.00	163.2
Average revenue/ton	$6.99	240.2
Average revenue/car-mile	1.74c	159.6

The consultant points out, however, that somewhat higher figures in scrap revenue, as compared with those for iron ore, should be expected. This is due to scrap revenues of single-car shipments being compared with iron ore revenues of multiple-car shipments.

C. *Development of cost data.*—The consultant's cost data are based on 1972 Rail Form A[15] unit costs prepared by the Commission's Section of Cost and Valuation. At the time of preparation of its cost statement, however, the Commission's Statement No. 1C1-72, *Rail Carload Cost Scales for the Year 1972*, had not been officially released to the public. Therefore, it was necessary for the consultant to obtain and utilize 1972 data prepared by the Section of Cost and Valuation for computer processing, in punch card form, which was available. These data were processed by consultant using the Commission's 1970 Rail Form A computer program to derive 1972 unit costs by type of car involved in the issue traffic. The consultant states that appropriate rearrangement of the data was made to compensate for the differences between the Commission's 1970 and 1972 computer programs since the latter was not yet available to the public. As noted previously, the consultant developed costs for only three regions, region III—official, region IV—southern, and region VII—western.

The 1972 unit costs developed by the consultant were subsequently compared with the preliminary but unpublished 1972 unit costs developed by the Commission and later published in its Statement No. 1C1-72, *supra.* This comparison indicated no significant differences with the exception of cost region IV, southern. As a result of unit cost differences in this region, the preliminary unit costs prepared by the Commission for region IV were used. In all instances the unit costs applicable to average weight train were used rather than way and through train costs.

---

[15] *Formula for Use in Determining Rail Freight Service Costs*. Statement No. 1F1-73.

The consultant states that in order to reflect the lower costs incurred with multiple-car movements the following adjustments were made to the above territorial average costs.

Scrap iron and steel.—Terminal carload costs were reduced by 15 percent, that is, 85 percent of the total terminal carload costs were applied. The consultant notes that this reduction was a judgmental adjustment due to a lack of specific studies conducted with regard to scrap movements. However, the consultant argues that the 15-percent reduction is conservative in comparison to the reduction in costs made by the Commission for trainload shipments in its 1969 "Burden Study," Statement No. 1S3-69, *Rail Revenue Contribution by Commodity and Territory for the Year 1969.*

No adjustments were made to the line-haul costs.

Iron ore movements.—The adjustments pertaining to iron ore movements were reported to be the same as those derived by the Commission's Cost and Valuation Section in its 1969 rail "Burden Study" of multiple-car shipments. The consultant states that the line-haul and terminal costs were reduced to the following percentages:

TABLE 118

Consultant's cost reductions

	Region III	Region IV	Region VI
	Percent	*Percent*	*Percent*
Line-haul, car-mile	89	89	82
Do------ ton-mile	74	74	73
Terminal, carload	49	49	49
Do------ ton	not adjusted		

The consultant elected not to show fully allocated costs. It is the consultant's contention that allocation of fixed costs is not useful in the context of this study since by definition constant costs are not variable with traffic volume. Therefore, they should not be allocated on a cost basis to any particular traffic.

The consultant applied the above developed variable unit costs to its randomly selected sample of scrap and iron ore movements drawn from the 1972 waybill tape. A comparison of these costs with the previously developed per-car revenues by cost regions and mileage blocks is shown in the consultant's table 7, our table 119. This comparison was made for the purpose of showing the revenue contribution of scrap and iron ore (revenues in excess of variable costs) and the contribution as a percentage of total revenues.

The consultant states the results of this comparison disclose that scrap revenue for single as well as multiple-car shipments makes a positive contribution above variable costs on both a per-ton and per-car basis. For example, the revenue contribution on scrap for single-car shipments ranges from $3.23 per ton in the West to $3.93 per ton in the East and on a per-car basis from $179 to $233.50, respectively. For the entire sample, all regions combined, the weighted average contribution on scrap for single-car shipments was $3.40 per ton, $191.82 per car, or 48.6 percent of revenues. Similar results are shown for multiple-car shipments of scrap in the East and South with an average revenue contribution on a per-ton basis of $3.27 and $3.03, and on a per-car basis of $228.80 and $180.23, respectively. No results were shown for multiple-car shipments in the West since the sample of multiple-car shipments in that region reportedly consisted entirely of intrastate traffic with relatively light loadings and nonrepresentative revenues per carload.

TABLE 119

Consultant's calculation of revenue above variable costs (contribution) for a random sample of iron ore and ferrous scrap traffic, 1972 by cost region and mileage block

Cost region/mileage block		Iron ore			Scrap					
		Contribution per			Multiple-car contribution per			Single-car contribution per		
		Ton	Car	Percent of revenue	Ton	Car	Percent of revenue	Ton	Car	Percent of revenue
	Miles	*Dollars*	*Dollars*		*Dollars*	*Dollars*		*Dollars*	*Dollars*	
III	1. 1-50	1.03	75.76	49.8	0.86	55.80	33.4	0.88	64.50	33.0
	2. 51-100	1.24	96.50	52.1	1.69	124.74	45.8	1.28	75.21	33.1
	3. 101-150	1.63	139.79	54.0	2.23	150.28	49.0	3.72	219.65	54.9
EAST	4. 151-200	1.38	114.88	45.8	4.72	315.14	62.2	4.11	193.32	48.4
	5. 201-250	1.80	149.43	47.7	4.95	356.60	61.2	6.33	406.57	63.1
	6. 251-300	2.02	153.06	46.3	2.85	192.56	44.2	4.22	290.07	52.7
	7. over 300	1.49	106.80	29.7	4.41	330.52	52.3	5.37	328.26	51.5
	All	1.54	119.84	42.0	3.27	228.80	53.6	3.93	233.53	51.9
IV	1. 1-50	n.a.	n.a.	----------	0.88	42.58	37.1	1.18	53.01	36.9
	2. 51-100	n.a.	n.a.	----------	1.62	102.37	51.6	1.76	95.82	47.2
	3. 101-150	0.77	73.34	48.4	2.40	139.48	56.9	2.11	104.81	46.6
SOUTH	4. 151-200	1.88	140.66	54.0	2.54	134.81	50.7	2.91	178.12	55.4
	5. 201-250	1.66	119.77	47.8	2.86	196.20	55.6	3.49	220.96	56.8
	6. 251-300	1.26	95.56	40.6	3.10	176.28	50.8	3.75	199.68	52.1
	7. over 300	0.86	70.68	29.4	4.33	262.15	53.9	4.93	299.40	57.5
	All	1.04	88.43	42.6	3.03	180.23	53.0	3.30	186.98	53.8

Consultant's calculation of revenue above variable costs (contribution) for a random sample of iron ore and ferrous scrap traffic, 1972 by cost region and mileage block—Continued

Cost region/mileage block		Iron ore			Scrap					
		Contribution per			Multiple-car contribution per			Single-car contribution per		
		Ton	Car	Percent of revenue	Ton	Car	Percent of revenue	Ton	Car	Percent of revenue
	Miles	*Dollars*	*Dollars*		*Dollars*	*Dollars*		*Dollars*	*Dollars*	
VII WEST	1. 1-50	(0.10)	(8.44)	—	See note below			0.29	18.42	13.3
	2. 51-100	0.17	12.77	13.9	do			1.74	88.95	39.7
	3. 101-150	0.41	34.14	26.8	do			1.88	97.22	38.2
	4. 151-200	n.a.	n.a.	—	do			2.72	115.88	39.8
	5. 201-250	1.37	133.13	54.9	do			3.54	192.99	48.8
	6. 251-300	0.88	89.42	35.0	do			4.31	243.32	52.6
	7. over 300	1.52	140.85	30.4	do			5.38	343.59	49.1
	All	0.79	67.28	29.1	do			3.23	179.09	45.8
	All traffic	1.05	87.46	36.2	3.12	197.01	53.3	3.40	191.82	48.6

Note: The sample of multiple-car shipments in this region consists of intrastate traffic with relatively light ladings and non-representative revenues per carload. Results for "all traffic" exclude region VII data.

Source: Computed from 1972 Waybill Study Sample.

In comparison, the revenue contribution on iron ore ranged from $0.79 in the West to $1.54 in the East on a per-ton basis and from $67.28 to $119.84 on a per-car basis. For the entire sample of iron ore, the weighted average revenue contributions per ton and per car were $1.05 and $87.46, respectively.

The consultant states that it is clear from this comparison that scrap revenue contributions are at a significantly higher level than for those computed for iron ore shipments. A summary of these comparisons provided by the consultant is found in table 120. This summary indicates that contributions per ton of scrap in single-car shipments are from 255 percent to 409 percent of that which was computed for single-car iron ore shipments. The revenue contribution per ton for multiple-car shipments of scrap also ranged from 212 percent to 291 percent of the comparable multiple-car iron ore shipments.

TABLE 120

Consultant's comparison of "contribution" by scrap and ore traffic based on sample from 1972 waybill sample with contribution by ore equal to 100.

Cost region item	Scrap percentage of ore	
	Single-cars	Multiple-cars
III		
Contribution per ton	255	212
Do per car	195	191
Do as percent of revenue	124	128
IV		
Contribution per ton	317	291
Do per car	211	204
Do as percent of revenue	126	124
VII		
Contribution per ton	409	Not available, see text:
Do per car	266	
Do as percent of revenue	188	
All (excluding region VII in respect of multiple cars)		
Contribution per ton	324	297
Do per car	219	225
Do as percent of revenue	134	147

Source: Derived from study sample.

Finally, the consultant notes that these contributions on scrap iron have been obtained in spite of rate "holddowns." Thus, it is evident that the nonapplication of general rate increases to scrap has not inhibited the carriers from obtaining a higher-than-average revenue for their services.

Rebuttal to Verified Statement No. 10.—Southern in its rebuttal statement to Verified Statement No. 10 takes exception to the selection method employed by the consultant in its subsample of scrap as taken from the 1972 waybill file. As noted previously, this subsample consisted of 5 selected waybills in each of the first 6 mileage blocks (50-mile blocks from 1 to 300 miles) and 10 waybills for movements over 300 miles for each destination territory. Based on the 1972 waybill file, 72.6 percent of the scrap waybills involved official territory. Further, 62.7 percent of the scrap traffic moved 100 miles or less and 82.8 percent moved 200 miles of less. It is Southern's contention, however, that the subsample disregards this concentration of scrap in official territory by selecting 40 waybills for each destination territory. Moreover, Southern states the subsample ignores the vast amount of scrap traffic in the lower mileage blocks since 25 percent of the waybills selected were for movements over 300 miles.

Southern also submitted a comparison of the scrap sample averages shown by the consultant with the DOT 1972 Carload Waybill Statistics and the ICC 1972 Freight Commodity Statistics. This comparsion set forth in table 121 below indicates that the scrap averages shown by the consultant are grossly exaggerated. For example, the average haul shown by the consultant for 1972 exceeds that of the DOT Carload Waybill Statistics by 77 miles per car.

TABLE 121

Comparison of consultant's sample with 1972 DOT Carload Waybill Statistics and 1972 ICC Freight Commodity Statistics

Scrap	Consultant's sample	DOT 1972[1] Carload Waybill Statistics (TD-1)	ICC 1972 Freight Commodity Statistics
Average miles/car	227	150	----------
Average tons/car	56	56	[2]55.7
Average revenue/car------dollars	395	298	[2]307.75
Average revenue/ton-------dollars	6.99	5.32	[2]5.52

[1] United States to United States figures.

[2] Calculated from originated traffic.

Further, it is noted that the sample revenue per car and revenue per ton exceeds the ICC and DOT statistics by $87.25 and $97 per car and $1.47 and $1.67 per ton, respectively.

A similar comparison is made of the consultant's sample scrap movements in the East with the ICC and DOT averages for official territory. This comparison, provided in table 122 below, reveals that the average revenue per car from the consultant's sample exceeds the DOT average by $171 per car and the ICC average revenue per car by $153.31. Likewise, the consultant's sample revenue per ton exceeds both the DOT and ICC statistics by $2.40 to $2.68 per ton.

TABLE 122

Comparisons of consultant's official territory statistics

Scrap	Consultant's sample	DOT 1972[1] Carload Waybill Statistics (TD-1)	ICC 1972 Freight Commodity Statistics
Average miles/car	193	105	----------
Average tons/car	59	57	[2]57
Average revenue/car------dollars	450	279	[2]296.69
Average revenue/ton-------dollars	7.58	4.90	[2]5.18

[1] Official to official.

[2] Calculated from originated traffic.

Southern contends the overstatement of scrap average miles and average revenue per car and average revenue per ton observed in consultant's sample for the United States and official territory is also present in southern territory. A comparison of the consultant's sample of southern territory traffic with the 1972 1-percent waybill sample and the ICC Freight Commodity Statistics is shown in table 123 below. As can be seen the consultant's average revenue per car exceeds the ICC and DOT statistics by $61.39 and $89 per car, respectively.

TABLE 123

Comparison of consultant's southern territory statistics

Scrap	Consultant's sample	DOT 1972[1] Carload Waybill Statistics (TD-1)	ICC 1972 Freight Commodity Statistics
Average miles/car	215	149	------------------
Average tons/car	57	52.9	[2]52.7
Average revenue/car------dollars	348	259	[2]286.61
Average revenue/ton-------dollars	6.13	4.90	[2]5.43

[1] South to South.
[2] Calculated from originated tonnage.

A similar comparison is also made between the consultant's sample and the Southern's actual experience in 1972. This comparison is shown in table 124 below:

TABLE 124

Comparison of consultant's statistics with Southern Railway operating data

Scrap	Consultant's sample	Southern Railway[1]
Average miles	215	143
Average tons/car	57	53
Average revenue/car------------dollars	348	199.81
Average revenue/ton------------dollars	6.13	3.77

[1] ICC Quarterly Commodity Statistics.

During 1972 Southern indicates it handled 1,437,774 net tons (short tons) of scrap which generated gross revenues of $5,420,756 or average revenue of $3.77 per net ton. In comparison, the consultant's study shows for southern territory an average revenue for scrap traffic of $6.13 per ton or $2.36 per ton higher than that of Southern. The average tons per car shown in the consultant's sample of southern territory scrap traffic is 57 net tons compared with 53 net tons per car for Southern scrap traffic in 1972.

Moreover, Southern states that its scrap revenue per car for 1972 can be calculated by multiplying its average revenue per ton of $3.77 by the average load per car of 53 net tons. This produces revenue of $199.81 per car which is $148.19 per car lower than the sample average revenue per car shown by consultant's of $348 for southern territory.

Southern argues it is clear from the above comparisons that the consultant's sample of southern territory scrap traffic bears little resemblance to Southern's scrap traffic. One of the reasons for this difference is that the consultant's sample of scrap traffic is based on line-haul movements which disregard the volume of scrap iron switching tonnage. For example, Southern notes that in its own opening statement (No. 12 hereto) it projected annual scrap switching traffic of 5,892 cars, 311,628 net tons, and revenues of $238,524 based on three Southern terminals. Combining the scrap switching and line-haul traffic, results in total scrap traffic of 33,184 cars, 1,749,402 net tons, and gross revenues of $5,659,280. Therefore, the average revenue of all Southern scrap traffic is estimated to be $170.54 per car and $3.23 per net ton. A comparison of these figures with those shown in table 124 above indicates the consultant's average revenues in the southern territory on scrap exceed those of Southern by $2.90 net ton and $177.46 per car.

Finally, Southern compares the revenue contribution of the consultant's scrap sample with Southern's calculated revenue contribution shown in its opening statement to be covered later in this report. This comparison is set forth in table 125 below:

TABLE 125

Scrap iron contribution comparison

	Consultant's sample[1]	Consultant's sample[2]	Southern Railway
Contribution:			
For car	$194.33	$186.98	$24.93
Per ton	3.50	3.30	.46

[1] Table 5, page 44 of the Moshman Report.

[2] Table 7, page 23 of the Abraham Report.

It can be seen that the scrap contribution shown by the consultant exceeds that of Southern's by $162.05 per car and $2.84 per ton. Southern attributes this overstatement of scrap revenues and resulting contributions in the consultant's study to the methodology used in saturating both the scrap and iron ore samples with long-haul movements. Moreover, Southern states that the revenues of the consultant's sample are not representative of either the 1972 DOT

Carload Waybill Statistics or the ICC Freight Commodity Statistics or Southern's traffic.

Rebuttal to Verified Statement No. 10.—Western Railroad Association (WRA) in its rebuttal statement to Verified Statement No. 10 notes that the 1972 1-percent waybill tape was used by the consultant as the basis for its cost-rate comparison of scrap and iron ore. However, WRA questions the use of these data in light of the various errors found by the consultant in the 1972 1-percent waybill tape. WRA likewise questions the use of the 1969 waybill tape since errors were also found by the consultant in that tape. Despite this, the consultant employs both the 1969 and the 1972 waybill information in its cost study.

WRA states that no explanation was provided by the consultant as to the reasoning for the selection of the various mileage blocks in the statistical distribution of the 1972 waybill data. Moreover, WRA is critical of the consultant's developing cost data based on cost region VII, western district. WRA indicates that, contrary to the consultant's statement, a separation between cost region V, western district excluding mountain Pacific and transterritory, and region VI, mountain Pacific and transterritories, is still being provided by the Commission and shown recently in ICC Statement No. 1C1-72, *supra.*

A review of the consultant's working papers by WRA indicated that certain movements were deleted from the study sample in both the iron ore and scrap categories. While the consultant stated that 5 study sample movements were replaced for various reasons, WRA notes that a total of 46 study sample movements, *6 iron ore and 40 scrap,* were deleted. The movements, deleted along with the reasons stated for each deletion as provided by the consultant, are shown in respondent's appendix A. WRA states the following reasons were given by the consultant for the deletions.

1. Probable switching movements.
2. High revenue ratios.
3. Low revenue, very low revenue/car, low revenue ratios, or low revenue/ton-mile.
4. Low tonnage, low tonnage/car, tonnage too low, tons too low, and low tons.

It is WRA's contention that the consultant's statistical subsample does not conform to the format contained in the Bureau of Economics Statement No. 71-1, *Guidelines for the Presentation of the Results of Sample Studies.* As a result the subsample has not been shown representative of the 1-percent waybill study from which the sample was initially taken.

WRA also takes exception to the consultant's statistical comparisons between scrap and iron ore. WRA points out that the rail transportation characteristics of these two commodities are different and defy a comparison. For example, iron ore traffic moves in multiple-car lots from only a few origins to a relatively few destinations, whereas scrap generally moves in single-car shipments between a great many origins and destinations. The two are not comparable in that the rates and costs are generally lower for multiple-car shipments than they are for single-car shipments.

In order to illustrate the traffic patterns of the two commodities within each of the rate territories, WRA submitted its appendix D. This appendix sets forth the traffic patterns of each of the two commodities as a percentage of total involved traffic by mileage blocks, as selected by the consultant. For example, in official territory most scrap movements fall within the 50-mile block with a tapering-off beyond that mileage block. On the other hand, there is a light movement of iron ore in the official territory at the 50-mile block with most movements falling within the 200-mile block. In the South, scrap traffic moves predominately at the 50- to 200-mile blocks whereas the iron ore is negligible at these distances with the preponderance (over 75 percent) of the ore traffic at the 250- to 300-mile blocks. For WTL territory the reverse is true; practically all of the iron ore traffic is at the 50- to 100-mile blocks and the heavy movement of the scrap is at the distance of over 300 miles. Respondent indicates that the latter being "over 300 miles" could also mean the preponderance of the movements of scrap could be for distances of 500 miles or more. A hundred percent of the iron ore traffic in southwestern territory is in the "over 300 mile" block with the scrap traffic spread over all of the mileage blocks with the heaviest movements falling in the 50-mile block and the over-300-mile block. In the mountain Pacific region there is practically no movement of ore at the 50-mile block while over 75 percent of the ore traffic is about equally divided between the 250-, 300-, and over-300-mile blocks. In contrast over 48 percent of the scrap falls within the 1- to 50-mile block.

WRA also submitted a comparison of the total records of iron ore and scrap as shown in the 1972 waybill tape with the subsamples made by the consultant. This comparison shows the percentage relationships of the consultant's selected traffic study to the total records of the 1972 waybill tape as well as the percentage the consultant's cost study waybill records are of the total 1972 waybill records. This comparison indicates that, of the total iron ore records in the 1-percent waybill tape, only 2.44 percent were selected for the traffic study and 2.27 percent for the cost study. In connection with scrap, only 4.82 percent of the 1-percent waybill records were selected for the traffic study and only 3.84 percent for the cost study. Thus, WRA is of the opinion that such a thin sample would not produce meaningful results. Consequently, further doubt is cast upon the validity of those revenue/cost comparisons which are based on this subsample.

Rebuttal to Verified Statement No. 10.—The witness for Armco Steel Corporation, Inland Steel Company, Republic Steel Corporation, and Youngstown Sheet and Tube Company (Four Steel Companies) observes in its rebuttal statement to Verified Statement No. 10 that a comparison of traffic statistics derived from the 1969 and 1972 waybill statistics is shown in the consultant's table 2. However, it is this witness' opinion that this comparison is invalid because of the unreliability of the 1969 waybill data, particularly as to iron ore movements. Deficiencies in the 1969 waybill data may be indicated by the following comparison of data for the years 1966, 1969, and 1972, the 3 most recent years for which data are available.

TABLE 126

Average haul per car in the United States iron ore compared with iron and steel scrap

	Iron ore (Com. Cl. 101)	Iron and steel scrap (Com. Cl. 40211)
1966	136	147
1969	239	150
1972	118	150

Source: ICC and DOT Statement No. TD-1, Years 1966, 1969, and 1972.

As can be seen from table 126, the average haul for iron ore changed erratically in 1969 compared with 1966 and 1972. This change, in this witness' opinion, is due to the nature of the statistics included in the 1969 waybill sample rather than any real change in the rail operations associated with iron ore.

Moreover, it is this witness' opinion that the consultant improperly equates multiple-car shipments of iron ore with multiple-car shipments of scrap. This comparison ignores the very substantial difference in the character of multiple-car shipments of the two commodities. Multiple-car shipments of iron ore often consist of trainloads of 100 cars or more, whereas multiple-car shipments of scrap averaged about 5 cars.

It is noted that revenue comparisons drawn by the consultant for iron ore and scrap are constructed at the September 1973 rate level. The witness for the Four Steel Companies argues, however, that the consultant's cost study fails to consider rate increases that have occurred since September 1973. Since September 1973, increases have been granted by the Commission in Ex Parte Nos. 299, 301, 303, and 305. The witness contends that two of these rate increases, those allowed in Ex Parte No. 303 (4 percent) and Ex Parte No. 305 (10 percent), were applied to iron ore and not to scrap. The witness indicates, if consideration were given to these increases, the comparisons shown by the consultant would change considerably.

For example, referring to the purported revenue contribution earned by iron ore and scrap and shown in the consultant's table 7, reveals the following. For all iron ore movements within the East (region III) the contribution of \$1.54 per ton is based on revenue of \$3.67 per ton (\$1.54 ÷ 0.42) and variable cost of \$2.13 (\$3.67 - \$1.54). The average revenue figure of \$3.67 per ton reflects the average iron ore rate charged in 1972. This figure was increased 5.6 percent by consultant to bring the rate up to the September 1973 level. Further, rate increases applicable on iron ore since that time have raised the September 1973 rate by an additional 22 percent. In total, iron ore rates as of Ex Parte No. 305 are more than 28 percent higher than the level of rates shown in the consultant's study based on operations in 1972. Thus, the witness for the Four Steel Companies argues the average rate of \$3.67 computed above for iron ore should be increased to \$4.71 to reflect the X-305 rate level. This amounts to an increase in the 1972 average rate of \$1.04 per ton.

The witness states that in the case of scrap the contribution per ton as computed by the consultant and shown for multiple-car movements reflects average revenue of \$6.10 per ton (\$3.27 ÷ 0.536) and variable cost of \$2.83 per ton (\$6.10 - \$3.27). The cumulative effect of rate increases in Ex Parte Nos. 281, 295, 299, and 303 on scrap amounts to about a 12-percent increase over the rate level reflected in the 1972 revenues shown in the consultant's table 7. Application of this amount of increase to the revenue of \$6.10

computed above results in adjusted revenue of $6.84 or an increase of 74 cents per ton. Thus, the understatement of present revenue contained in the consultant's 1972 data amounts to $1.04 per ton in the case of iron ore as contrasted with 74 cents per ton for scrap.

The consultant, in describing costs which he developed for movements of iron ore, states that the costs are adjusted to reflect the lower costs incurred with multiple-car movements as compared with single-car movements of scrap in average weight trains. However, it is this witness' contention that multiple-car movements per se do not necessarily produce costs which are lower than the territorial average cost. For instance, territorial costs developed in the Commission's Carload Cost Scales and employed in the consultant's table 6 reflect a weighing of multiple- and single-car shipments, with the result that the unit costs reflect an average of more than one car per shipment. Such costs are not solely applicable to single-car movements. Moreover, the adjustment factors developed by the Commission's Cost and Valuation Section for use in its Burden Study cover all movements of iron ore and are not limited to multiple-car movements.

This witness also contends that no support has been offered for the arbitrary 15-percent reduction in terminal cost made by the consultant for multiple-car scrap movements. It does not necessarily follow that the switching of a five-car shipment of scrap (an example cited by the consultant) is performed at less cost than the territorial average costs. Switching of five cars in a group may require less time per car than switching single cars at a particular location, but the consultant has not shown that the switching of five-car multiples of scrap iron requires less time than the territorial average. Further, since territorial average switching costs reflect the handling of more than one car at a time, it is possible that costs associated with single-car movements of scrap could be substantially higher than the territorial average costs.

In addition, the witness takes exception to the consultant's "suspicion" that its costs for scrap are overstated. The point made by the consultant, that heavier loading for scrap as compared with territorial average traffic produces higher costs, is invalid. The witness states that it necessarily follows that lower unit costs are computed on the basis of higher-than-average loads than would be developed on the basis of average loads. Also, the consultant has offered no support for its statement that the costs are overstated since the empty return ratio on scrap cars is "significantly" lower than the territorial average return on the same type of car.

Finally, the witness is of the opinion that the variable costs per ton shown by the consultant appear to be severly misstated. For example, the consultant notes that substantial differences exist between scrap and iron ore with respect to the adjustments made by the consultant. However, despite the combined effect of these substantial differences, there is a spread of only 88 cents per ton between the cost developed for iron ore ($1.85) and the cost developed for multiple-car movements of scrap ($2.73). In view of the substantial adjustments purportedly made in the iron ore cost and the considerably shorter haul for iron ore, this relatively small amount of difference cannot be reconciled. Likewise, the contribution shown for single-car movements of scrap iron reflects a cost of $3.60 per ton in contrast to the cost of $2.73 per ton developed for multiple-car movements. On this basis, costs for multiple-car movements are only 76 percent of the costs for single-car movements. The witness states that a 24-percent reduction in total cost for multiple-car shipments of scrap iron cannot be reconciled with the consultant's statement that he has employed average costs except for a 15-percent reduction of only the terminal cost per carload.

Consultant's surrebuttal to Verified Statement No. 10.—The consultant notes that the principal complaint voiced in the rebuttal statement is directed at the 1-percent waybill data for 1969 and 1972 which it used as the basis of its study. The consultant states that in its opening statement it not only acknowledged that some errors and deficiencies existed in the waybill data, but took care in removing entries from its study that were incomplete or erroneous. Moreover, the consultant states it was compelled to use the waybill data since this was the only information of this type available to the public. The consultant notes that had the railroads provided the information enumerated in the Commission order of December 1973 then the consultant could have avoided the utilization of clearly deficient data.

Nevertheless, it is the consultant's opinion that it retained only those data in the sample which were found to be complete and reasonable. Further, it is argued that these data are suitable and their validity acceptable in the limited manner in which they were used.

Because of the deficiencies of the waybill data, the consultant states it refrained from basing any cost and contribution analysis and comparisons of the entire file content. Rather, it extracted from the waybill population a subsample representing a number of discreet and identifiable movements.

The consultant notes that several affiants in their rebuttal statements argue that the subsample is not representative of the traffic mix and volume of the iron ore and scrap traffic handled by the railroads in 1972. It is the consultant's contention, however, that the subsample was not intended to be representative of the population from which it came. Instead the consultant indicates the selected sample seeks to provide comparable information for both commodities. Further, it is argued that, in spite of its small size, the subsample has meaningful statistical significance by permitting, upon "fitting" the data with a linear regression curve, more than 35 degrees of freedom.

The consultant asserts that the allegation that regional cost factors do not reflect the transportation characteristics of scrap and iron ore traffic is unwarranted. Moreover, the consultant contends it is incumbent upon the railroads to provide cost data that reflect their experience in handling this traffic. For example, the adjustment factors used for iron ore are the same as those utilized by the Commission in its so-called "Burden Study" to reflect the average cost experience of handling multiple carloads of ore. Further, the argument that unadjusted cost factors reflect both single- and multiple-carload shipments is irrelevent because the consultant's adjustment factors account for the difference between the mix of traffic and multiple-car traffic.

Further, the consultant contends there is no merit to the criticism concerning the 15-percent reduction applied to the carload terminal expenses for multiple-carload scrap shipments. Such an adjustment, the consultant believes, is conversative. For example, if it is assumed that terminal switching for five cars takes twice as much engine time as switching for one car, then the engine-minute expense per car in a five-car cut is approximately 40 percent of the cost of a single-car movement. Recognizing, however, that the per-car averages contained in the regional cost factors reflect both multiple- and single-car traffic, the consultant applied the 60-percent reduction only to 71.1 percent of the engine-minute expense. The consultant computed the 71.1 percent on the basis of the estimated percentage of single-car movements shown in the waybill file as recapped in table 127 below:

TABLE 127

Single-car and multiple-car movements in waybill file

	Total number waybills in table 3	Estimated cars represented by these waybills	Percent of total estimated cars
Single cars	4,112	4,112	71.1
Multiple cars (5 each)	335	[1]1,675	28.9
All	4,447	5,787	100.0

[1] Represents number of waybills x numbers of cars per waybill (335x5).

Utilizing the 1972 unit costs published by the Commission in Statement No. 1C1-72, *supra*, for a general-service gondola car the following reduction by territory in terminal costs on account of reduced engine-minute expense can be shown.

TABLE 128

Reduction in terminal costs due to reduced engine-minute expense

	Regions		
	III East	IV South	VII West
1. Average engine-minute expense per car.	$62.60	$34.55	$53.70
2. Reduced engine-minute expense, multiple-car moves, per car, line 1 x 0.6 x 0.711.	26.71	14.74	22.91
3. Total unadjusted terminal expense per average car.	116.74	73.81	106.32
4. Line 2 as percent of line 3	22.88	19.97	21.55

As can be seen from this estimate, the reduction in engine-minute expenses alone—ignoring all other terminal carload expenses, though on average these account for as much as 46.4 percent of total terminal expenses in the East, 53.2 percent in the South, and 49.5 percent in the West—is more than 15 percent in each of the three regions. The consultant states the above example demonstrates the conservatism of the multiple-car terminal cost adjustment used in its calculations.

In addition, the consultant takes exception to the criticism directed at its failure to consider rate increases granted the carriers subsequent to September 1973. The consultant states it has endeavored to comply wherever possible with the specific instructions required by the Commission's order of December 27, 1973, in presenting freight rates on scrap as of September 1, 1973. This was the cutoff date established by the Commission.

Nevertheless, it is observed that increases applicable on scrap rates since September 1973 in Ex Parte Nos. 295, 299, 301, 303, and 305 amount to an average of 28 percent, the same rate of increase computed by the witness for the Four Steel Companies for iron ore. However, the consultant states the difference is that the increases applicable to iron ore amount to an average of $1.04 per ton while for scrap it is $1.70 on multiple-car movements. In other words, the increase per ton of scrap is 66 cents more than for ore is opposed to the Four Steel Companies witness' figure of 74 cents in favor of ore, a net difference of $1.40 per ton.

Comments.—Generally, the thrust of the above reply statements is directed at the data utilized by the consultant for the Institute of Scrap Iron and Steel in connection with the various traffic and rate-cost relationships presented. The principal complaint voiced in these rebuttal statements concerns the consultant's use of the 1-percent waybill data for 1972, which as previously noted, the consultant utilized for its traffic data in preparing an analysis on scrap and iron ore. In addition, certain traffic statistics derived from the 1972 waybill file were compared with statistics from the 1969 waybill file. Both the 1969 and 1972 waybill studies reflect a 1-percent random sample of rail traffic in the United States and each was designed to be implicitly reflective of all rail freight traffic on a proportional basis.

Several parties question the validity of the 1969 and 1972 waybill studies. The Coordinator recognizes that a number of deficiencies exist in both the 1969 and 1972 waybill studies. The quality of the waybill data in 1969 was especially poor in respect to certain commodities such as iron ore. In the opinion of the Coordinator the use of the 1969 waybill data in comparing scrap and iron ore could produce unreliable results. The relative merits of the 1969 study, however, will be discussed in part I(D)(6).

In the introduction of the Commission's *Rail Revenue Contribution Study for the Year 1972,* the following explanation is provided with respect to errors found in the waybill records.

> A review of the 1972 waybill file by the Bureau of Economics disclosed deficiencies in the completeness of the 1972 data base used for this burden study. A total of 4,847 waybill records is missing from the data base, having been either inadvertently missed

during tabulation or discarded because of poor and unusable data. There are approximately 6,000 waybill records in the waybill tape file which have car type deficiencies that exclude their use in this study. Of a total of 214,400 records, approximately 10,800, or 5 percent, were not used in the burden study because of some deficiency. These deficiencies are not randomly distributed through the file. For example, four large railroads accounted for almost 50 percent of the car type errors and 27 percent of these were attributed to one large northeastern railroad.

While deficiencies in the completeness of the 1972 waybill file have been discovered, we do not believe they are of the magnitude as to render the study invalid.

As can be seen, these errors which amounted to approximately 5 percent of the waybills sampled were not used in the Burden Study. We note that the consultant utilized the results of the 1972 waybill file prior to its being edited by the Commission. However, the consultant found errors in the waybill tape in the form of blanks and zeroes. These errors were reportedly excluded and presumably were not reflected in the consultant's study results. Therefore, the use of the 1-percent waybill tape for 1972 does not in itself discredit the consultant's sample study.

Both the Southern and WRA are also highly critical of the consultant's sampling procedures employed in selecting a subsample of scrap and iron ore from the 1972 waybill file. A review of the consultant's methodology for selection of a subsample of scrap and iron ore movements as taken from the 1972 waybill sample follows.

Generally, the Coordinator feels that the sampling procedures used are not based on standard and acceptable techniques and practices of probability sampling. Further, it is noted that weighting errors found in the consultant's subsample could cause significant biases in the final results shown in table 7 in its exhibit.

In addition, the consultant has failed to explain why two subsamples were taken and only one subsample was used. The sole reason given as to why the one subsample was rejected was that it was "unusual." Nor was an adequate explanation given as to why 5 waybills were chosen for each of the six mileage blocks (1 through 6) and 10 waybills were selected for mileage block 7, 301 miles and over.

It is believed that the consultant arbitrarily rejected individual waybills from inclusion in the study on the grounds that they did not meet the criterion of "reptitive movements." The consultant in his verified statement stated there were only five deletions made. However, it was observed in one rebuttal statement (WRA's) that there were a total of 46 scrap and iron ore movements deleted from the study.

Based on these comments it appears that the consultant's subsample is not representative of the 1-percent waybill sample from which the subsample was taken. As a result, the revenue-to-cost comparisons developed for these sample shipments do not represent the traffic mix and volume of the iron ore and scrap traffic handled by the railroads in 1972.

Southern's comparison of the scrap sample averages shown by the consultant with DOT's 1972 Carload Waybill Statistics and the Commission's 1972 Freight Commodity Statistics casts further doubt on the validity of the consultant's sample. Southern's findings are shown in table 129 below.

TABLE 129

Southern Railway scrap sample averages

Scrap	Consultant sample	DOT 1972 carload waybill statistics	ICC 1972 freight commodity statistics
United States to United States			
Average miles/car	227	150	----------------
Average tons/car	56	56	57.7
Average revenue/car (dollars)	395	298	[1]307.75
Average revenue/ton (dollars)	6.99	5.32	[1]5.52
Official to official			
Average miles/car	193	105	----------------
Average tons/car	59	57	[1]57
Average revenue/car (dollars)	450	279	[1]296.69
Average revenue/ton (dollars)	7.58	4.90	[1]5.18
South to South			
Average miles/car	215	149	----------------
Average tons/car	57	52.9	[1]52.7
Average revenue/car (dollars)	348	259	[1]286.61
Average revenue/ton (dollars)	6.13	4.90	[1]5.43

Calculated from originated traffic.

This comparison reveals that the average revenues per car and average revenue per ton shown by the consultant for scrap exceeds both the DOT and ICC averages by significant amounts in every instance. Also the average tons per car shown by the consultant for southern territory scrap traffic exceed the DOT and ICC averages by more than 4 tons per car. The above comparison suggests that the consultant's subsample contains higher-than-average scrap revenue movements. If this is the case, then the resulting revenue-to-cost ratios shown by the consultant for scrap are inflated.

The consultant does not present any new evidence in its surrebuttal to support the study sample. The consultant merely asserts that the sample was properly chosen, that it seeks to provide comparable information for scrap and iron ore, and that it has meaningful statistical significance.

Moreover, the consultant refutes his own study by agreeing with its critics on page 18 of its surrebuttal statement that the study does not represent the traffic mix and volume of the iron ore and scrap traffic handled by the railroads in 1972. On page 22, however, the consultant states "our study sample was randomly selected from the One Percent Waybill sample population." In order for a sample to be valid it must represent the frame from which it was selected. As previously noted the sample does not represent the frame nor does the consultant claim that it does.

In light of the inadequacies in the sampling procedure, it is the Coordinator's opinion that the consultant's conclusion on page 23 of its surrebuttal, "that scrap traffic in single cars contributes on the average 324 percent the amount of revenue contribution by multiple car ore movements," has little if any probative value.

The 1972 unit costs developed by the consultant for region III, official, and region VII, western, appear to have been properly developed. These costs compare favorably with the unit costs for the same two regions as developed by the Commission in its Statement No. 1C1-72, *supra,* since released to the public. However, it would have been preferable to have used a combination of region I (New England) and region II (official excluding New England), instead of region III (official), which is a composite of regions I and II. this is because the unit costs in a particular region differ. As a result the region in which the railroad is assigned should be used in costing out a movement whenever possible. The same holds true for region VII (western) which is a composite of region V (western excluding mountain Pacific and transterritory) and region VI (mountain Pacific and transterritory). The failure to use the particular region in which the railroad or railroads are assigned could have a significant effect on the development of cost for a given movement.

Moreover, we agree with WRA's rebuttal comments that contrary to the consultant's statement, a separation between cost region V and region VI is still being provided by the Commission in Statement No. 1C1-72, *supra.*

The consultant's use of average weight train costs instead of a combination of way train and through train costs in its cost study is another deficiency. For example, it is generally recognized that trainload shipments of iron ore would incur little, if any, way train costs due to the different operating characteristics of solid trains. The consultant also included interchange costs on a loaded car-mile basis whereas it would have been preferable to have included it on the actual basis of the actual number interchanges incurred.

With respect to the 15-percent reduction in the terminal costs made by the consultant for multiple-car shipments of scrap, we agree with the consultant that such a reduction appears conservative even though the reduction is a judgmental adjustment.[16]

The Four Steel Companies argue that it does not necessarily follow that the switching of a five-car shipment of scrap (an example cited by the consultant) is performed at less cost than the territorial average costs. This argument is not persuasive. The witness for the Four Steel Companies concedes that switching of five cars in a group may require less time per car than switching single cars at a particular location but argues that the consultant has not shown that the switching of five-car multiples of scrap requires less time than the territorial average. While this witness makes a good point with regard to the territorial carload unit costs used by the consultant reflecting an average of more than one car per shipment, it should nevertheless be noted that these unit costs are heavily weighted toward single-car shipments. Thus a 15-percent reduction in terminal costs to give effect to multiple-car shipments is acceptable.

The adjustments to the terminal costs for multiple-car shipments of iron ore also appear acceptable. These are essentially the same adjustments made by the Commission in its 1969 and 1972 Burden Study. However, the following comments are warranted. First, the consultant refers to all movements other than single-car as multiple-car shipments. Normally multiple-car shipments are associated with movements of approximately 5 to 10 cars moving in an existing train, whereas a movement of say 90 cars is referred to as a trainload shipment. No distinction was made by the consultant between the two different types of shipments. The steel companies' contention that the rates shown by the consultant should be increased to give effect to increases granted by the Commission since September 1973 is without merit. The Commission's order of December 30, 1973, clearly states that "representative and/or repetitive rates and narratives depicting the freight rate structures and formulas upon which the freight rates on scrap iron and steel are based, *as of September 1, 1973,* should be shown." [Emphasis added.] While we recognize that substantial rate increases have been authorized by this Commission subsequent to the above date, these rate increases were primarily the result of cost increases incurred by the rail carriers. Thus, it would be improper to increase the rates to a more current level without increasing costs to the same level.

---

[16] However, it should be noted that the example cited in consultant's surrebuttal with respect to a reduction in switching costs is questionable. The 71-percent reduction factor used to split single- and multiple-car shipments is based only on the mix of scrap traffic whereas the territorial average costs are based on all traffic. In other words, the 71-percent factor has not been shown to be representative of the total traffic mix between single- and multiple-car shipments.

It is important to note that scrap certified as recyclable, in most instances, has been subject to (1) no increase, (2) lesser increase, or (3) delayed increase in the recent past. The cumulative effect of rate increases in Ex Parte Nos. 281, 299, 303, and 305 on scrap amounts to approximately a 28-percent increase over the rate level reflected in the 1972 revenues shown in the consultant's table 7. During this same period, rates on iron ore have increased by an almost identical amount or 27 percent. The witness for the Four Steel Companies had previously indicated that rate increases applicable to iron ore during this period amounted to 28 percent in comparison to only 12 percent for scrap. The difference between the consultant's 12 percent and the 28 percent shown by the Four Steel Companies appears to result from a late application of Ex Parte Nos. 301 and 305-A to scrap which increase was not included in the consultant's calculations. Tables 130 and 131 summarize various increases authorized by the Commission on scrap and iron ore since 1972.

Several affiants espouse convincing arguments against the *revenue* comparison made by the consultant between scrap and iron ore shipments. For example, it is noted that scrap moves from many origins to many destinations, whereas iron ore moves from a limited number of origins to relatively few destinations. Also, it is observed that rates on scrap are higher than those on iron ore because of the nature of the traffic. More importantly, it is noted that scrap moves predominately in single-car shipments, whereas iron ore moves almost exclusively in multiple-car and trainload shipments.

The significant difference in transportation characteristics between scrap and iron ore cannot be denied: the difference in the value of the two commodities, in the volume of the traffic, in the conditions under which they move, and in the risk and cost of handling them ordinarily results in a substantial difference in the rates under which they are carried. Therefore, the consultant's comparison of the rates on scrap with the rates on iron ore is of little value in support of the allegation made by ISIS that a discrimination in the rates exists in favor of iron ore.

Nevertheless, we believe that a comparison of rate-to-variable-cost ratios between scrap shipments and iron ore shipments is proper. Such a comparison when properly determined shows the profitability of the two commodities giving proper consideration to the differences in revenue caused by the differences in cost of service.

TABLE 130

Permanent increases allowed on iron ore and scrap iron and steel after January 1, 1972

	Iron ores (STCC 10 1)	I/S Scrap (STCC 40 211)	
		Other than certified	Certified as recyclable
Tariff X-281-B:			
	E-4%, max. 22¢ GT	B-4%	B-4%
	S-4%	C-3%	C-3%
	A-5%	D-5%	D-5%
Tariff X-295-B:			
	F-3%, max. 22¢ GT	F-3%	F-3%, max. 20¢ NT or 22¢ GT
	G-3%	G-3%	G-3%, max. 20¢ NT or 22¢ GT
Tariff X-299-B	2.8%	2.8%	2.8%
Tariff X-303-B	4%	4%	4%
Tariff X-305-A	3.3% plus 10%	3.3% plus 10%	3.3%
Tariff X-310-A	7%	7%	7%, max. 28¢ NT or 31¢ GT

Explanation of symbols used in tables 130 and 131:

A—Interterritorially; and within West.
B—Within East; and from South to East.
C—Within South; and from East and West to South.
D—Within West; from South to West; and between East and West.
E—Within East.
F—Within East; and between East, on the one hand, and South and West, on the other.
G—Within South; within West; and between South and West.
S—Within South.

TABLE 131

Permanent and temporary increases allowed on iron ores and scrap iron and steel after January 1, i972

Date		Iron ores (STCC 10 1)	I/S Scrap (STCC 40 211)	
			Other than certified	Certified as recyclable
Feb. 5, 1972	Tariff X-281	2 1/2% surcharge	2 1/2% surcharge	2 1/2% surcharge
July 16, 1972	Sup. 18 to X-281	2 1/2% surcharge	2 1/2% surcharge	Surcharge canceled.
Oct. 23, 1972	Tariff X-281-B:			
		E-4%, max. 22¢ GT	B-4%	----------
		S-4%	C-3%	----------
		A-5%	D-5%	----------
Aug. 13, 1973	Sup. 30 to X-281-B:			
		E-4%, max. 22¢ GT	B-4%	B-4%
		S-4%	C-3%	C-3%
		A-5%	D-5%	D-5%
Aug. 19, 1973	Tariff X-295-A:			
		F-3%, max. 22¢ GT	F-3%	----------
		G-3%	G-3%	----------
Nov. 16, 1974	Sup. 26 to X-295-A:			
		F-3%, max. 22¢ GT	F-3%	F-3%, max. 20¢ NT or 22¢ GT
		G-3%	G-3%	G-3%, max. 20¢ NT or 22¢ GT
Oct. 1, 1973	Tariff X-299	1.9%	1.9%	1.9%
Jan. 1, 1974	Tariff X-299	2.6%	2.6%	2.6%
Mar. 16, 1974	Tariff X-299-A	2.8%	2.8%	2.8%
Jan. 29, 1974	Tariff X-301	2.1%	2.1%	2.1%
Mar. 9, 1974	Tariff X-301-A	2.5%	2.5%	2.5%
Apr. 1, 1974	Tariff X-301-B	2.8%	2.8%	2.8%
May 1, 1974	Tariff X-301-C	3.0%	3.0%	3.0%
June 1, 1974	Tariff X-301-D	3.3%	3.3%	3.3%

See footnotes at end of table.

Permanent and temporary increases allowed on iron ores and scrap iron and steel after January 1, 1972—Continued

Date		Iron ores (STCC 10 1)	I/S Scrap (STCC 40 211)	
			Other than certified	Certified as recyclable
Mar. 9, 1974	Tariff X-303-A	4%	4%	
Dec. 1, 1974	Tariff X-303-B	4%	4%	
Dec. 19, 1974	Sup. 5 to X-303-B	4%	4%	4%
June 5, 1974	Tariff X-305[1]			
June 20, 1974	Tariff X-305-A	3.3% plus 10%	3.3% plus 10%	3.3%
Apr. 27, 1975	Tariff X-310-A	7%	7%, max. 28¢ NT or 31¢ GT	7%, max. 28¢ NT or 31¢ GT
May 27, 1975	Sup. 5 to X-310-A	7%	7%	7%, max. 28¢ NT or 31¢ GT

---

[1] On June 5, 1974 the 3.3% fuel increase in tariff X-301-D was changed to 0.3% and a 3% fuel increase was published in tariff X-305. Tariff X-305-A, which became effective June 20, 1974, included a 3.3% fuel increase table, and tariff X-301-D was simultaneously canceled.

Explanation of symbols used in tables 130 and 131:

A—Interterritorially; and within West.
B—Within East; and from South to East.
C—Within South; and from East and West to South.
D—Within West; from South to West; and between East and West.
E—Within East.
F—Within East; and between East, on the one hand, and South and West, on the other.
G—Within South; within West; and between South and West.
S—Within South.

It will be noted that increase changes indicated in table 131 are not in every instance in strict chronological order. That is so because all changes made pursuant to a particular ex parte increase proceeding (in supplements to or reissues of the first effective tariff bearing that ex parte proceeding number) are indicated before the increases imposed in the first effective tariff bearing the number of the next ex parte increase proceeding are indicated.

The increases set forth in the above tables are, of course, those provided for in the master general increase tariffs. It should be borne in mind that not all rate tariffs are made subject fully, or even in part, to a particular increase tariff.

Verified Statement Number 11.—Verified Statement No. 11 was submitted on behalf of the EPA. The EPA has introduced into evidence a report entitled *Analysis of Transportation Rates and Costs for Selected Virgin and Secondary Commodities*, prepared for EPA by Moshman Associates, the same consulting firm that submitted Verified Statement No. 10.

The study was commissioned by the EPA to examine and compare transportation rates for secondary (scrap) and virgin materials and to examine the basis for these rates. In addition, the study also contained a comparison of the intercommodity rate and cost relationship between scrap and iron ore. While the study includes other scrap and virgin materials, scrap iron and steel is the only commodity subject to the instant investigation.

The report indicates that three major points were researched: (1) the reasonableness of the rates for each of two commodities, scrap and iron ore; (2) the fairness of the level of rates for secondary commodities; and (3) the magnitude of the effect of transportation charges on prices. Primary emphasis was placed on movements by railroads since this is the predominant mode used to transport these two commodities.

The consultant's analysis of the two competing commodities involved the selection of a subsample of iron ore and scrap iron rail movements from the 1969 One Percent Sample of Railroad Waybills prepared by the ICC. The preliminary work involved selecting a large number of common moves. Common moves were defined as those having the same origin and destination. Additional criteria for the movements to be selected were that they must have been in a high density corridor and must have had a similar length of haul (within 10 percent plus or minus). However, this selection process was found unsatisfactory since the criteria made fewer common moves available for study. As a result, the selection process was expanded to include supplemental moves in order to reflect the entire distance range over which these two commodities moved.

Based on the above common move criteria, 25 movements each of scrap and iron ore were selected. Further, one supplemental move of iron ore and five supplemental movements of scrap were chosen to round out the subsample. The consultant points out that the subsample figures for the two commodities are not comparable with the averages developed in the Commission's waybill study due to different methods employed in obtaining the subsamples.

The consultant developed variable costs for the above-sampled movements based on the Commission's Statement No. 1C1-69, *Rail Carload Cost Scales by Territories for the Year 1969*. For costing purposes, gondola general service cars were used in computing costs for scrap moves and open hopper general service cars were used for iron ore.

In computing costs for iron ore, the unit cost factors from the above statement were adjusted by an unexplained method. These adjustments reportedly had the following cost-reducing effect:

TABLE 132

Consultant's cost reductions

	Cost region III	Cost region VII
	(percent)	*(percent)*
Line haul:		
Per ton	26	27
Per car-mile	11	18
Terminal:		
Per carload	51	51
Per ton	None	None

No cost adjustments were made to the scrap movements.

For each of the study rail moves, a computer printout was prepared showing origin and destination territory, short-line mileage, and the code for the origin carrier. Each movement was then assigned to a cost region based on the groupings the origin carriers are assigned by the Commission's Cost and Valuation Section.

For intraterritorial moves the cost factors for the appropriate region were applied. For interterritorial moves, however, the following procedure was followed: the shortest available route was identified by tracing the haul on a standard railroad map; the mileage for each participating carrier was calculated and all segments summed for each territory; the total miles were compared with the total short-line miles shown in the waybill file; the difference between these totals, if any, was ascertained and applied on a percentage basis to each segment of the interterritorial move. The resulting mileages were applied to the line-haul cost factors for each of the applicable cost territories. Terminal costs were calculated by applying origin terminal costs at the level of the origin cost territory and destination terminal costs at the level of the destination cost territory. No adjustments were made for the specific numbers of line-haul interchanges, *e.g.*, the interchange was included on a line-haul mileage basis.

The resulting variable cost calculations for each study move were shown in the consultant's appendix A.

No attempt was made to develop fully allocated costs for the sample movements. It is the consultant's contention that constant costs are not variable with traffic and, therefore, should not be allocated on the basis of any cost-causing characteristics.

In assigning rates to the various movements, published rates found to be applicable as the result of a tariff search were used regardless of the revenue stated in the waybills. All rates searched were established at the 1969 rate levels generally and included the Ex Parte No. 259-B increases authorized by the ICC as of November 28, 1969.

The following two tables set forth the revenue/cost relationship for the movements studies and contribution to railroad revenues of these movements.

TABLE 133

Railroad revenue and variable cost for study moves by distance blocks

VIRGIN COMMODITY: IRON ORE

Mileage blocks	Number of moves	Average revenue/ car	Average revenue/ ton	Average revenue/ ton-mile	Average variable cost/ ton-mile
0-68	5	$144	$1.77	$0.028	$0.013
112-149	6	209	2.28	0.016	0.008
151-177	6	174	2.28	0.14	0.008
226-385	7	277	3.47	0.010	0.006
434-513	2	272	3.91	0.007	0.006
821-1,252					
All blocks	26	211	2.60	0.012	0.007

Secondary commodity: iron & steel scrap

Mileage blocks	Number of moves	Average revenue/ car	Average revenue/ ton	Average revenue/ ton-mile	Average variable cost/ ton-mile
0-68	5	228	4.08	0.066	0.033
112-149	4	288	5.46	0.042	0.020
151-177	7	351	6.11	0.037	0.016
226-385	7	461	7.52	0.023	0.010
434-513	3	472	7.05	0.015	0.008
821-1,252	4	623	17.43	0.016	0.010
All blocks	30	398	7.17	0.024	0.012

Note: Averages for all blocks represent totals for all study moves divided by appropriate total service units, *e.g.*, total revenue ÷ total tons moved, total variable costs - total ton miles, et cetera.

Source: Computed from consultant's Master Tables, appendix A.

TABLE 134

Contribution to railroad revenue by study moves in distance blocks

VIRGIN COMMODITY: IRON ORE

Mileage blocks	Number of moves	Contribution per car	Contribution as percent of revenue
0-68	5	$77.00	53.3
111-149	6	109.00	52.1
151-177	6	68.50	39.4
226-385	7	103.29	37.3
434-513	2	55.50	20.4
821-1,252	--------	--------	--------
All blocks	26	87.84	41.5
Secondary commodity: iron & steel scrap			
0-68	5	112.40	49.3
112-149	4	149.25	51.8
151-177	7	197.00	56.1
226-385	7	255.85	54.6
434-513	3	207.67	43.9
821-1,252	4	219.50	35.2
All blocks	30	194.33	48.8

Source: Computed from consultant's Master Tables, appendix A.

For the movements selected for study, iron ore revenues amounted to 171 percent of variable costs, while scrap revenues totaled 196 percent of variable costs. Thus, the scrap revenue contribution is 35 percent higher than that shown for iron ore (96 percent as compared with 71 percent). The study observes that the most glaring difference in relationship relates to the rates over longer distances where the scrap revenue contribution remains high while the revenue contribution on iron ore declines. Generally it is noted that the rates for scrap are consistently higher regardless of distances. Nevertheless, the study recognizes that the differences in rates can be attributed in part to the higher costs of hauling the scrap, *e.g.*, the diseconomics associated with moving lighter cars and fewer cars at a time.

The consultant's report states that emphasis should be placed on the movements in the first three mileage blocks since that is supposedly where the bulk of the traffic moves. Approximately 77 percent of the ore movements and 76 percent of the scrap movements in the waybill subsample were shown to be less than 200 miles in length. The consultant points out that by looking only at this "short-haul" traffic, it can be seen that the rates for scrap are considerably higher than for ore. However, the report concludes that the difference in rates would appear to be cost justified. In addition, the report indicates that iron ore and scrap moves less than 200 miles in length were found to be treated fairly equitable on the basis of the costing procedures applied. However, the report expresses some concern about the lack of "concise costing procedure for the short scrap movements" which might reveal "a less equitable situation."

Rebuttal to Verified Statement No. 11.—The witness for the Four Steel Companies in its rebuttal statement to Verified Statement No. 11 takes exception to the consultant's report for the following reasons: (1) the report is based on an admittedly deficient traffic sample, (2) the revenues and costs are for the year 1969 which cover a period 5 years past, (3) the consultant's revenues do not include separate rate increases since Ex Parte No. 295 for iron ore as compared with scrap, (4) distortions exist in the average haul for iron ore due to the unrealistic pairing with scrap movements, and (5) cost adjustments for iron ore are based on broad territorial factors developed only for region III (official) and region VII (western). These items are discussed at length below.

The witness contends that the consultant's report is based wholly on deficient traffic data taken from the Department of Transportation's Carload Waybill Statistics for the year 1969. The deficiencies in the data were recognized in the Commission's report, *Rail Revenue Contribution by Commodity and Territory for the Year 1969,* Statement No. 153-69.

An indication of these deficiencies, particularly as to iron ore, may be found by comparing the average length of haul shown in the consultant's report for iron ore movements in 1969 with data developed in the prior and subsequent waybill studies, i.e., those for the years 1966 and 1972. For example, in the year 1966, the average haul shown in the waybill studies for iron ore was 136 miles. In 1969 the average produced by the waybill study employed in the consultant's report amounted to 239 miles, a 76-percent increase over the average for 1966. In 1972, the average developed in the waybill study dropped back to 118 miles, less than half the average developed in the 1969 study.

The witness also states that the consultant in attempting to "match pairs" of movements of scrap and iron ore has distorted the relationship between short-haul and long-haul movements of iron ore. For example, the 1969 study, which produced an overstated average for iron ore, showed that 77 percent of the ore movements were for distances of less than 200 miles. However, the sampling basis employed in the consultant's report studied nine movements of iron ore having hauls greater than 226 miles. These nine movements represent 35 percent of the total movements studied.

The witness indicates that the significance of the average haul is apparent in the data presented in the consultant's report. The report shows (table 5) that for hauls up to 68 miles revenue contribution derived from iron ore equalled 53 percent of revenue as compared with 49 percent for scrap movements of the same distance. For hauls in the 112- to 149-mile block, iron ore contribution, expressed as a percent of revenue, also exceeded the contribution made by scrap. Beyond 151 miles, the consultant's report developed purportedly higher contributions for scrap than for iron ore.

As previously stated, waybill studies in 1966 and 1972 developed average hauls for iron ore (Commodity Class 101) of 136 miles and 118 miles, respectively. In contrast, the 1969 movements sampled in the consultant's report reflect an average haul of 206 miles per carload. Because of the matching process employed in the study, an excessive number of movements at the longer distances is included for iron ore with the result that the relativity of the contribution made by iron ore and scrap is seriously distorted. The effect of this distortion is present in the ratio of contribution to revenue, 41.5 percent, shown in the consultant's report for all movements of iron ore. It is this witness' contention that if short-haul movements had been given a greater weighing in the study, this ratio would have been considerably higher.

Rebuttal to Verified Statement No. 11.—A rebuttal statement to Verified Statement No. 11 was submitted by Bertrand N. Bauer on behalf of the Western Railroad Traffic Association (WRTA).

The WRTA report is highly critical of the sampling methods used to produce data on iron ore and scrap in the consultant's study. WRTA maintains that the Commission's *Guidelines for the Presentation of the Results of Sample Studies* were not followed.

Specifically, criticism is directed at the study's "astonishingly small frame" used to develop the data which WRTA asserts are not large enough to develop reliable results. WRTA also states that the shipments used in the study are not representative of the ICC waybill frame from which the study movements were drawn. Moreover, WRTA does not accept the 25 paired (common) moves of iron ore shipments with scrap shipments as being a random sample. WRTA contends that there is little likelihood that the moves were selected at random because of missing gaps in the frame printout obtained by the consultant.

WRTA also takes exception to the use of supplementary moves being added to the original 25 paired movements selected for study. WRTA maintains that this results in the selections from two frames being improperly mixed together.

In addition, WRTA states that the EPA's "Valuation Sample" method used in showing that the original sample was representative is invalid. This is because the Valuation Sample is not based on any known statistical models.

Rebuttal to Verified Statement No. 11.—Southern in its rebuttal to Verified Statement No. 11 states that a review of the consultant's report indicates that the sample movements selected for study are not representative of the 1969 Carload Waybill Study nor the universe of scrap traffic represented by the Commission's Freight Commodity Statistics.

For example, appendix A of the consultant's report discloses that 22 of the 30 scrap movements or 73 percent of the total movements shown are hauls of over 150 miles. Additionally, 14 of the 30 scrap movements or 47 percent are hauls of over 200 miles. However, the Commission's Rail Revenue Contribution Study, Statement No. 1S3-69 prepared from the 1969 waybill sample indicates the average length of haul for scrap in the United States is 150 miles. Southern contends a further comparison of the sample with the averages of the waybill sample demonstrates the selected scrap movements are heavily weighted with long-haul movements. The average length of haul of the consultant's sample scrap movements is 328 miles (table 37, page 182). Moreover, Southern notes that 23 of the 25 common scrap movements shown in the report or 92 percent were in official territory. The average length of haul for scrap in official territory according to the 1969 waybill sample is 108 miles; however, only 5 of the 30 study movements shown in the report were less than 108 miles.

Southern states that the deficiency of the consultant's sample can be further observed by comparing the average revenue per ton with the 1969 waybill sample.The consultant's sample shows an average revenue of $7.17 per ton based on the 30 scrap movements sampled, whereas the United States average revenue per ton from Statement No. 1S3-69, *supra,* is calculated at $4.50 per ton (revenue of

$1,344,260 divided by 298,690 tons). Moreover, the ICC Freight Commodity Statistics for 1969 indicate that the United States average revenue per ton for scrap, based on originated tonnage, is $4.37 per ton or $2.80 per ton less than the average of the movements selected by the consultant.

Southern notes that on page 143 of the consultant's report it is asserted that scrap rates are 196 percent of the average rate per ton for iron ore. This figure is purportedly higher than that experienced by Southern in 1969. Southern alleges that its average revenue on iron ore in 1969 was $2.43 as compared with $3.75 for scrap. Thus, Southern's ratio of revenue per ton on scrap as compared with revenue per ton on iron ore was 152 percent in 1969 in comparison with the 196 percent shown in the consultant's report.

Surrebuttal to Verified Statement No. 11.—A surrebuttal to Verified Statement No. 11 was submitted by Moshman Associates on behalf of EPA. In response to affiants' criticism that the sample of moves in the EPA report are not representative of the railroad traffic as a whole or the 1-percent waybill sample, consultant states the sample was not intended to be representative of the universe of rail moves. It was chosen to reflect a specific type of traffic, namely intercity line-haul movements of repetitive traffic for scrap and line-haul movements of repetitive traffic moving in ex-lake, import, or all-rail domestic service for iron ore.

Consultant notes that confusion has arisen from its statement that the sample moves were chosen randomly. While the actual selection of sample moves was performed by a random process, the sample frame was not selected in that manner. Rather the sample frame was constructed from the waybill file subject to the constraints that the iron ore and scrap movements be of common characteristics regarding distance, origins. et cetera.

As to several affiant's contentions that the study findings, based on 1969, are outdated, consultant response is that the 1969 waybill tape was the most current file available at the time the report was written. Moreover, consultant states that the report was not undertaken to meet the specific requirements of the Commission's order of December 27, 1973, but rather was submitted in connection with Ex Parte No. 295 (Sub-No. 1) but believed by consultant to be of value in this present proceeding as well.

Consultant asserts that despite the obvious difference in transportation characteristics between scrap and iron ore alluded to by affiants, the reason for pairing the moves was to achieve distance comparability so that revenue, cost, and contribution of the two commodities could be compared at several points on a distance spectrum. The matching process was designed in such a way as to insure that equal distant moves of each commodity were selected.

The consultant notes that one affiant criticizes its cost adjustments used for iron ore. The consultant points out that these adjustments were obtained from the Commission's Cost and Valuation Section which developed them from the reports of predominant ore hauling railroads for use in the "Burden Study." Moreover, while the adjustment factors are admittedly imprecise, as all regional cost factors are, the adjustment factors were the best available.

Finally, in response to criticism of the sampling procedures employed, the consultant maintains that (contrary to its previous admission of nonstatistical subsampling) it followed valid statistical procedures in sampling. Moreover, the sampled data clearly demonstrate that significant differences exist between the rates charged virgin materials (iron ore) and those levied on secondary commodities (scrap) in those corridors in which they compete.

Comments.—The consultant's report sets forth various statistical comparisons relating to rail movements of scrap and iron ore. All of these comparisons are based on data contained in the Department of Transportation's *Carload Waybill Statistics for the Year 1969* and the Commission's *Rail Carload Cost Scales by Territories for the Year 1969* (Statement No. 1C1-69).

As noted, affiants in their rebuttal statements contend that deficiencies in the 1969 waybill data, particularly with respect to iron ore, render the report unreliable. This contention has merit. Both the DOT and the Commission's staff uncovered deficiencies in the preliminary data. For example, in the Commission's *Rail Revenue Contribution by Commodity and Territory for the Year 1969,* Statement No. 153-69, the following reference is made to certain deficiencies discovered in the 1969 waybill data:

> The 1969 Waybill data on tape was subjected to extensive analysis by the Bureau of Economics that was formerly charged with the function of handling Waybill material at the Commission. In its analysis of the 1969 Waybill tape, the Bureau of Economics discovered certain deficiencies in the data. The relatively poor quality of the data resulted primarily from errors in commodity coding (approximately a 6-percent error rate at the Standard Transportation Commodity Code five-digit level), car identification and multiple carload Waybill handling. In addition to Waybill processing deficiencies, inferior reporting by certain railroads, particularly in cases where poor tape records were submitted in lieu of Waybills, also contributed to the poor data results. The quality of the Waybill data was especially poor for the Northeast and in respect to certain commodities or commodity groups, such as coal,

iron ore and copper ore. These deficiencies should be taken into account in interpretation of our study results.

Further, in the course of reviewing the consultant's report, it was observed that averages for iron ore in 1969 derived for the destination territories western trunkline (WTL) and U.S. (ALL) are biased because a waybill was improperly included in the 1969 ICC waybill study. This waybill covered a shipment of 112 cars of iron ore pellets (STCC 1011320) originating in Minnesota and terminating in Illinois covering a distance of about 600 miles. Since in 1969 iron ore was subsampled at a rate of 1 out of 50, it was weighted by a factor of 50 yielding a total of 5,600 carloads out of a total of 13,250 terminations in WTL territory. The inclusion of this waybill biased the average mileage and revenue in 1969 for WTL and ALL territories upward since the average mileage and revenue for the other waybills are substantially lower. The data for iron ore excerpted from TD-1 for 1966, 1969, and 1972 shows this effect.

Table 135

Iron ore—TD-1

	1972	1969	1966
U.S. terminations:			
Carloads	12,789	20,300	17,103
Average haul per car (miles)	118	239	136
Average revenue per car	155	174	125
U.S. to WTL:			
Carloads	7,625	13,250	9,122
Average haul per car (miles)	71	239	77
Average revenue per car	96	163	69

Several affiants contend that the consultant's subsample is not representative of the frame from which it was selected. Numerous differences between the sample results and those depicted in the frame are cited as examples. The above contentions have merit. Moreover, the consultant, by its own admission in its surrebuttal statement on page 3, readily concedes the sample is not representative of the universe of rail moves. Further, the consultant refutes his own report by stating the study was not designed to meet the requirements of the Commission's order of December 27, 1973. It should be noted that this is the same report that was previously introduced before the Commission in Ex Parte No. 295 (Sub-No. 1), Increased Freight Rates and Charges, 1973—Recyclable Materials, Nationwide. The increase sought in Ex Parte No. 295 (Sub-No. 1) was granted by this Commission.

The consultant's surrebuttal argument that the study was designed to represent a specific type of traffic subject to various constraints is not persuasive. In effect, the consultant is actually suggesting that "two wrongs make a right," i.e., as long as two samples are selected in the same manner then they are valid regardless of whether or not they represent the universe. Such a suggestion is fallacious; in order for a sample to be valid it must represent the frame from which it was selected.

A review of the variable costs shown in the consultant's appendix A indicates that the basic cost data were derived from the Commission's *Rail Carload Cost Scales for the Year 1969, supra.* While the consultant has failed to submit its underlying work papers showing the computation of these costs, we can find little fault with the explanation provided in the report concerning its method of costing. The only discrepancy noted is that no adjustment was made for the specific number of line-haul interchanges; rather, the interchange costs were presumably included in the territorial average costs on a loaded car-mile basis.

The costs for iron ore were reportedly adjusted to reflect studies on iron ore traffic made by the Commission's Cost and Valuation Section. These cost adjustments appear to be the same as utilized in the Commission's 1969 Burden Study for iron ore movements. However, there is some question of which territorial costs were used in computing costs for the iron ore movements. For example, the consultant states that unit costs for each of the seven cost regions (listed in the above publication) were developed. But the consultant shows that the cost for only two regions, region III (official) and region VII (western), were adjusted to reflect studies by the Commission on iron ore movements. Thus, we are unable to determine whether the consultant utilized only region III and region VII costs in computing iron ore costs or whether the same adjustment factors were applied to the other regions as well.

In view of the consultant's improper sampling procedures and the deficiencies noted in the 1969 waybill data, it is the opinion of the Coordinator that the conclusions reached by the consultant with respect to scrap and iron ore traffic are invalid.

TABLE 136

Statement of intercommodity rate and revenue/cost relationship between scrap iron and steel and iron ores

Scrap iron and steel

Origin	Destination	Rate per net ton (except as noted)	Minimum weight (pounds)	Average net tons per car	Carload revenue	Actual miles	Southern district rail form A average variable costs (thru September, 1973)	Extent rates used
Junction City, Ky	Cincinnati, Oh	$4.23	500,000	53	$224.19	119	$132.53	19,559 NT
Kernersville, N.C	Lynchburg, Va	4.38	500,000	54	236.52	132	137.38	35,374 NT
S. Raleigh, N.C	Floyd, S.C	4.38	500,000	54	236.52	239	177.80	18,144 NT
Chattanooga, Tenn	Alabama City, Ala	3.43	80,000	57	195.51	93	113.72	68,475 NT
Birmingham, Ala	N. Birmingham, Ala	1.19	80,000	34	(2)80.37	4	79.10	20,194 NT
N. Birmingham, Ala	Bessemer, Ala	1.19	80,000	65	(2)80.37	16	94.53	15,205 NT
Do	E. Birmingham, Ala	1.19	80,000	60	(2)80.37	2	78.73	41,788 NT
Do	Tarrant, Ala	2.38	80,000	60	142.80	8	106.75	20,310 NT
Columbus, Ga	Atlanta, Ga	3.83	80,000	45	172.35	116	118.88	14,338 NT
Macon, Ga	do	3.79	80,000	53	200.87	94	113.10	27,200 NT
Charlotte, N.C	Croft, N.C	(1)38.65	80,000	63	60.87	11	82.37	58,062 NT
Statesville, N.C	do	2.76	100,000	63	173.88	35	91.57	15,754 NT
Cleveland, Tenn	Chattanooga, Tenn	3.55	50,000	32	113.60	29	81.05	15,290 NT
Nashville, Tenn	Emory Gap, Tenn	4.89	112,000	58	283.62	164	167.15	20,569 NT
Rockwood, Tenn	do	1.88	100,000	53	99.64	7	80.53	14,653 NT
Alexandria, Va	Lynchburg, Va	(3)6.91	90,000	61	376.37	164	152.81	37,141 NT

(1)-Rate Per Car, Excess in Proportion
(2)-Reflects Rule 13 UFC Minimum Charge
(3)-Rate Per Gross Ton

Verified Statement No. 12.—Verified Statement No. 12 was submitted by the Southern. This party prepared a cost study showing the revenue and cost relationship separately for scrap and iron ore. A total of 16 movements are shown for scrap and 14 movements for iron ore. These movements were selected on the basis of a sample of "repetitive" single-line and joint-line movements involving the Southern in 1972.

The 16 movements shown for scrap reportedly represent the largest movements handled by Southern in 1972 in terms of tonnage volume. Further, these 16 movements represent approximately 38 percent of the total scrap tonnage handled by the Southern for 1972. Southern indicates that both interstate and intrastate scrap movements were included because a significant volume of scrap traffic handled by Southern is intrastate traffic. For 1972, Southern's intrastate traffic constituted 45.6 percent of total scrap tonnage. No information pertaining to the types of movements on iron ore traffic was provided.

The costs for both scrap and iron ore were reportedly based on southern region Rail Form A average 1972 variable costs indexed to a September 1973 level. However, the application of these costs to the traffic statistics was not provided. Southern merely indicates the cost calculations for scrap were based on a tare weight of 28.5 tons and an empty return ratio of 1.84. Also, Rail Form A average car ownership costs were reportedly used in computing the costs for scrap. With respect to the costs shown for iron ore, no explanation was given other than that Rail Form A costs were used.

The results of Southern's cost study are shown in column 8 of table 138. Of the 16 movements shown for scrap, carload revenue on 14 of the movements exceed variable costs at a 1973 level by ratios ranging from a low of 102 percent to a high of 246 percent. Only on two of the short-haul movements are scrap revenues below variable costs. It is Southern's contention that the carriers have attempted to increase rates on short-haul movements that are below variable cost levels. However, their efforts have been thwarted because the State regulatory bodies will not grant general rate increases within their respective States which are higher than those authorized for application on interstate traffic.

TABLE 137

Iron ore

Origin	Destination	Rate per net ton (except as noted)	Minimum weight	Average net tons per car	Carload revenue	Actual miles	Southern district rail form A average variable costs (thru September, 1973)	Extent rates used
(Import) Mobile, Ala	Alabama City, Ala	$3.00	1800 NT	89	$267.00	325	$227.03	227,751 NT
Do	Fairfield, Ala	3.00	1800 NT	99	297.00	267	232.37	20,687 NT
Do	N. Birmingham, Ala.	3.00	1800 NT	73	219.00	266	188.80	105,192 NT
Do	Thomas, Ala	3.00	1800 NT	90	270.00	268	201.52	1,976 NT
Do	Woodward, Ala	3.00	1800 NT	91	273.00	256	196.64	62,203 NT
(Import) Baltimore, Md	Bristol, Va.-Tenn	(1)7.23 GT	90% marked capacity.	82	527.79	682	440.43	32,289 NT
Pea Ridge, Mo	Alabama City, Ala	(1)6.50 GT	(2)	101	585.00	689	482.13	377,521 NT
Glenwood, Ala	do	3.27	100,000 lbs.	85	277.95	319	220.94	75,700 NT
Do	Thomas, Ala	2.75	100,000 lbs.	82	225.50	268	195.93	15,936 NT
Rockwood, Ala	Alabama City, Ala	2.08	90% marked capacity.	107	222.56	172	164.76	69,156 NT
Do	N. Birmingham, Ala.	1.72	90% marked capacity.	102	175.44	112	130.90	199,039 NT
Do	Thomas, Ala	1.72	90% marked capacity.	115	197.80	116	138.81	13,736 NT
Georgetown, Ga	Alabama City, Ala	3.14	100,000 lbs.	67	210.38	353	219.64	67,134 NT
Do	Thomas, Ala	2.75	100,000 lbs.	68	187.00	302	199.90	24,559 NT

(1)-Rate Per Gross Ton
(2)-Marked Capacity Of Car, But Not Less Than 140,000 Pounds

In the case of iron ore traffic, it can be seen from column 8 of table 139 that carload revenue exceeds variable costs on 12 of the 14 movements shown with ratios of revenue to variable cost ranging from a low of 115 percent to a high of 143 percent. On the two remaining movements, the relationship of revenue to variable costs was 96 percent and 93 percent, respectively.

In addition, Southern states that intraterminal and interterminal crosstown switching represents a significant volume of traffic on its line. For example, during the period March 15 through April 15, 1974, Southern indicates it handled 491 cars or 25,969 net tons of scrap in crosstown switching service at three of its major terminals, Birmingham, Ala., Atlanta, Ga., and Chattanooga, Tenn. The magnitude of the crosstown switching of scrap is shown by projecting the sample statistics for the above period on an annual basis. On this basis, it is estimated that in excess of 5,892 carloads of scrap or 311,628 tons were handled by Southern in crosstown switching. This tonnage volume is equivalent to 26 percent of the scrap tonnage handled by the Southern in 1972. Based on the above sample, respondent made a comparison of the projected revenues with variable costs for a 12-month period. Southern notes that the sample study tonnage may be understated if compared with other months. For example, for the period January 15 through February 15, 1974, Southern states it handled 200 carloads of scrap in crosstown switching service at Atlanta, compared with 108 carloads during the sample period. The lower number of carloads in the sample period was allegedly attributable to a shortage of gondola cars.

Southern region Rail Form A unit costs for intraterminal and interterminal switching for the year 1972 were reportedly used and indexed to reflect material price and wage rates effective January 1, 1974. No further explanation was given as to the method of computation employed.

The comparison of the projected revenues with variable costs is shown in table 140. The results of this comparison indicate that the movement of scrap in crosstown switching at the three terminals is handled at deficit of $138,676.08 for the projected 12-month period. Southern indicates that its purpose in developing this information on crosstown switching of scrap is to demonstrate that this traffic represents a substantial volume of tonnage and such service is being performed at rates which are below variable costs levels. Moreover, Southern contends this does not account for the switching traffic handled by other southern railroads serving these three terminals or the additional crosstown switching performed at other large ferrous scrap consuming points such as Chicago, Ill., St. Louis, Mo., and Cincinnati, Ohio.

Rebuttal to Verified Statement No. 12

No rebuttal evidence to Verified Statement No. 12 has been received by the Commission.

Comments.—The cost and special study data submitted by Southern in Verified Statement No. 12 cannot be verified since the Rail Form A application or the unit costs resulting therefrom and other pertinent supporting data used in the computation of the costs were not made part of the record.

Further, an adequate explanation was not provided as to the source of the basic cost data. From the evidence of record, we are unable to determine whether Southern developed the 1972 variable costs based on application of the Commission's Rail Form A, *Formula for Use in Determining Rail Freight Service Cost* to the 1972 expenses and statistics of rail carriers assigned to the southern region or if such costs were based on the Commission's Statement No. 1C1-72, *Rail Carload Cost Scales by Territories for the Year 1972.* While this statement was only recently published, the preliminary results have been available to the public since July 1974.

As to the method employed in updating the costs to the September 1973 level, no updating factor was shown nor was an adequate explanation given as to the methodology employed.

It should be noted that there is only a two-tenths of a ton difference between the tare weight of 28.5 tons used by Southern for a gondola general service car and the tare weight shown in the Commission Statement No. 1C1-72, *supra,* for a gondola general service car. The empty return ratio of 1.84 percent used by Southern is identical to the empty return ratio shown in the Commission's Statement No. 1C1-72, *supra.*

As noted, we are unable to verify Southern's variable cost per shipment for the 16 scrap and 14 iron ore movements shown in tables 136 and 137. However, a comparison between Southern's average variable costs indexed to a September 1973 level with the costs previously shown in part I(D)(3) for the same movements is shown in tables 138 and 139 below. The comparison for scrap in table 138 reveals some differences in costs. However, they do not appear significant. Carload revenue still exceeds variable costs on 12 of the 16 movements shown ranging from a low of 101 percent to a high of 258 percent. On two other movements revenue meets variable cost. The results of Southern's cost study also indicated that the revenues on only 2 of the 16 movements were below variable costs.

TABLE 138

Statement of intercommodity rate and revenue/cost relationship between scrap iron and steel and iron ores

Scrap iron and steel

Origin (1)	Destination (2)	Average net tons per car (3)	Carload revenue (4)	Actual miles (5)	Southern district rail form A average variable cost (Thru September 1973) (6)	Coordinator's variable cost indexed to September 1973 level (7)	Ratio of revenue to Southern's variable cost (column 4 + column 6) (8)	Ratio of revenue to Coordinator's variable cost (column 4 ÷ column 7) (9)
Junction City, Ky	Cincinnati, Ohio	53	$224.19	119	$132.53	$103.88	169	216
Kernersville, N.C.	Lynchburg, Va	54	236.52	132	137.38	109.08	172	217
S. Raleigh, N.C	Floyd, S.C	54	236.52	239	177.80	145.80	133	162
Chattanooga, Tenn	Alabama City, Ala	57	195.51	93	113.72	118.56	172	165
Birmingham, Ala	N. Birmingham, Ala	34	[1]80.37	4	79.10	80.58	102	100
N. Birmingham, Ala	Bessemer, Ala	65	[1]80.37	16	94.53	87.75	85	92
Do	E. Birmingham, Ala	60	[1]80.37	2	78.73	80.40	102	100
Do	Tarrant, Ala	60	142.80	8	106.75	83.40	134	171
Columbus, Ga	Atlanta, Ga	45	172.35	116	118.88	122.85	145	140
Macon, Ga	do	53	200.87	94	113.10	118.19	178	170
Charlotte, N.C	Croft, N.C	63	60.87	11	82.37	85.05	74	72
Statesville, N.C	do	63	173.88	35	91.57	97.56	190	178
Cleveland, Tenn	Chattanooga, Tenn	32	113.60	29	81.05	90.56	140	125
Nashville, Tenn	Emory Gap, Tenn	58	283.62	164	167.15	144.42	170	196
Rockwood, Tenn	do	53	99.64	7	80.53	82.68	123	121
Alexandria, Va	Lynchburg, Va	61	376.37	164	152.81	145.79	246	258
Simple average ratio							146	155

[1] Reflects Rule 13 UFC minimum charge.

TABLE 139

Iron ore

Origin (1)	Destination (2)	Average net tons per car (3)	Carload revenue (4)	Actual miles (5)	Southern district rail form A average variable cost (Thru September 1973) (6)	Coordinator's variable cost indexed to September 1973 level (7)	Ratio of revenue to Southern's variable cost (column 4 ÷ column 6) (8)	Ratio of revenue to Coordinatorn's variable cost (column 4 ÷ column 7) (9)
(Import) Mobile, Ala	Alabama City, Ala	89	$267.00	325	$227.03	$193.13	118	138
Do	Fairfield, Ala	99	297.00	267	232.37	202.95	128	146
Do	N. Birmingham, Ala	73	219.00	266	188.80	156.22	116	140
Do	Thomas, Ala	90	270.00	268	201.52	169.70	134	159
Do	Woodward, Ala	91	273.00	256	196.64	165.62	139	165
(Import) Baltimore, Md	Bristol, Va.-Tenn	82	527.79	682	440.43	429.68	120	123
Pea Ridge, Mo	Alabama City, Ala	101	585.00	689	482.13	501.97	121	117
Glenwood, Ala	do	85	277.95	319	220.94	249.05	126	112
Do	Thomas, Ala	82	225.50	268	195.93	226.32	115	100
Rockwood, Ala	Alabama City, Ala	107	222.56	172	164.76	173.34	135	128
Do	N. Birmingham, Ala	102	175.44	112	133.99	143.82	131	122
Do	Thomas, Ala	115	197.80	116	138.81	149.50	143	132
Georgetown, Ga	Alabama City, Ala	67	210.38	353	219.64	219.76	96	96
Do	Thomas, Ala	68	187.00	302	199.90	201.96	93	93
Simple average ratio							123	127

For iron ore movements shown in table 139, a comparison between Southern's 1973 variable costs and those costs computed by the Coordinator for the same 14 movements reveals only slight differences. For example, whereas Southern's cost study indicates that revenues on 12 of the 14 movements exceed variable costs, our cost calculations show revenues exceed variable costs on 11 of the 14 movements and revenue meets variable cost on 1 other movement.

Since Southern's method of cost computation of the scrap and iron ore movements was not provided, we are unable to reconcile therse differences in costs. For the most part Southern's costs nevertheless appear reasonable when compared with our costs.

Finally, a comparison in the above tables of the corresponding simple average ratios of revenue to variable cost (as computed by Southern) between scrap and iron ore indicates that the simple average ratio on scrap of 146 percent is higher than that shown for iron ore of 123 percent. Likewise the simple average ratio of revenue to variable cost for scrap as computed by the Coordinator is higher than that of iron ore, *e.g.*, 155 percent for scrap v. 127 percent for iron ore.

We are also unable to verify the intraterminal and interterminal switching deficit of $138,676.08 shown by Southern in its table 22, our table 140. However, the intra- and interterminal variable switching costs per car shown by Southern in the amount of $57.46 and $81.14 per car, respectively, compare favorably to that shown by the Commission in Statement No. 1C1-72, *supra,* for the year 1972 in the amount of $53.46 per car for intraterminal switching and $74.76 per car for interterminal switching. It should be noted that Southern's switching costs were based on the year 1972 indexed to a 1974 level, whereas the 1S1-72, *supra,* costs are at the 1972 level. As previously noted, we are unable to determine whether Southern developed the 1972 variable costs based on an application of the Commission's Rail Form A, *supra,* or whether such costs were based on the Commission Statement No. 1C1-72, *supra.* While Southern's switching costs per car are similar to those found in the latter statement for 1972, an observation should be made concerning the reputed $138,676.08 deficit. Southern estimated this annual revenue deficit based on a sample of the number of cars handled in crosstown switching at three of its major terminals during the period March 15 through April 15, 1974, and projected the results over a 12-month period. However, Southern has not attempted to show that this 30-day sample period is representative of the crosstown switching traffic handled on an annual basis. In fact, Southern indicates that the tonnage in the sample study may be understated if compared with other months. For example, Southern states it handled 200 carloads of scrap in crosstown switching service at Atlanta for the period January 15 through February 15, 1974, compared with 108 carloads shown for an equivalent period March 15 through April 15, 1974. As a result, Southern's traffic sample is suspect which in turn renders Southern's projected annual revenue deficit of $138,676.08 questionable.

TABLE 140

Statement of intraterminal and interterminal switching of scrap iron and steel at Birmingham, Ala., Atlanta, Ga., and Chattanooga, Tenn., during the period March 15 through April 15, 1974

Switching district	Period March 15 - April 15, 1974					Projected			Southern region Rail Form A variable switching costs		
	Cars	Revenue	Average carload revenue	Average tons	Total net tons	Total cars	Annual tons	Annual revenue	Per car	Projected annual costs	Estimated annual revenue deficit
Birmingham, Ala.											
Intraterminal	244	$8,567.16	$35.11	55.5	13,542	2,928	162,504	$102,802.08	$57.46	$168,242.88	$65,440.80
Interterminal	38	2,381.19	62.66	55.5	2,109	456	25,308	28,572.96	81.14	36,999.84	8,426.88
Atlanta, Ga.											
Intraterminal	93	3,556.78	38.24	55.8	5,189	1,116	62,268	42,675.84	57.46	64,125.36	21,449.52
Interterminal	15	726.00	48.40	55.8	837	180	10,044	8,712.00	81.14	14,605.20	5,893.20
Chattanooga, Tenn.											
Intraterminal	18	600.48	32.67	60.0	1,080	216	12,960	7,056.72	57.46	12,411.36	5,354.64
Interterminal	83	4,058.70	48.90	38.7	3,212	996	38,544	48,704.40	81.14	80,815.44	32,111.04
	491	19,890.31	40.51	52.9	25,969	5,892	311,628	238,524.00		377,200.08	138,676.08

SUMMARY OF COST EVIDENCE ANALYSIS

(1) Verified Statement No. 10 submitted on behlaf of ISIS is of questionable value. The subsampling procedures used in the study are not based on standard and acceptable techniques and practices of probability sampling; the study subsample is not representative of the frame from which it was selected; and, discrepancies were observed in the costing procedures employed.

(2) Verified Statement No. 11 submitted on behalf of EPA is of little or no value. The EPA study is based on the 1969 waybill file which has been found to contain deficient data, particularly with respect to iron ore; the subsampling procedures used do not conform to the Commission's *Guidelines for the Presentation of the Results of Sample Studies;* the study subsample does not represent the universe from which it was selected; and, the study data do not meet the evidentiary requirements established by the Commission's order in this proceeding dated December 27, 1973, that the revenues and costs be at the September 1, 1973, level, whereas EPA's study is at the 1969 level.

(3) Verified Statement No. 12 submitted on behalf of the Southern contains cost-revenue comparisons which are, for the most part, acceptable. Southern's method of cost computation was not shown; however, a comparison between Southern's cost results and those computed by the Commission for the same scrap and iron ore movements reveal only slight differences. Moreover, the intra- and interterminal switching costs per car shown by Southern compare favorably to those shown by the Commission in Statement No. 1C1-72, *supra.* However, the intra- and interterminal switching deficit of $138,676 shown by Southern cannot be verified.

(4) Based on the evidence of record, the Coordinator concludes that the revenues derived from scrap traffic exceed the variable costs of transportation.

While the Coordinator has taken exception, for various stated reasons, to the cost and revenue studies on scrap introduced by two of the three parties submitting cost evidence, the results of those studies (while indicating questionably high rate-to-cost ratios) nevertheless support the conclusion reached by Commission computations of rate-to-cost ratios that the scrap rates are generally compensatory, i.e., they exceed their variable costs. Commission computations show that the simple average rate-to-variable-cost ratios on single-car scrap shipments ranged from 154 percent in the southern territory to 158 percent in official territory. For multiple-car shipments the rate-to-variable-cost ratios ranged from 175 percent in the southern territory to 186 percent in official territory.

Part I(D)(5): Revenue/mileage scatter charts.

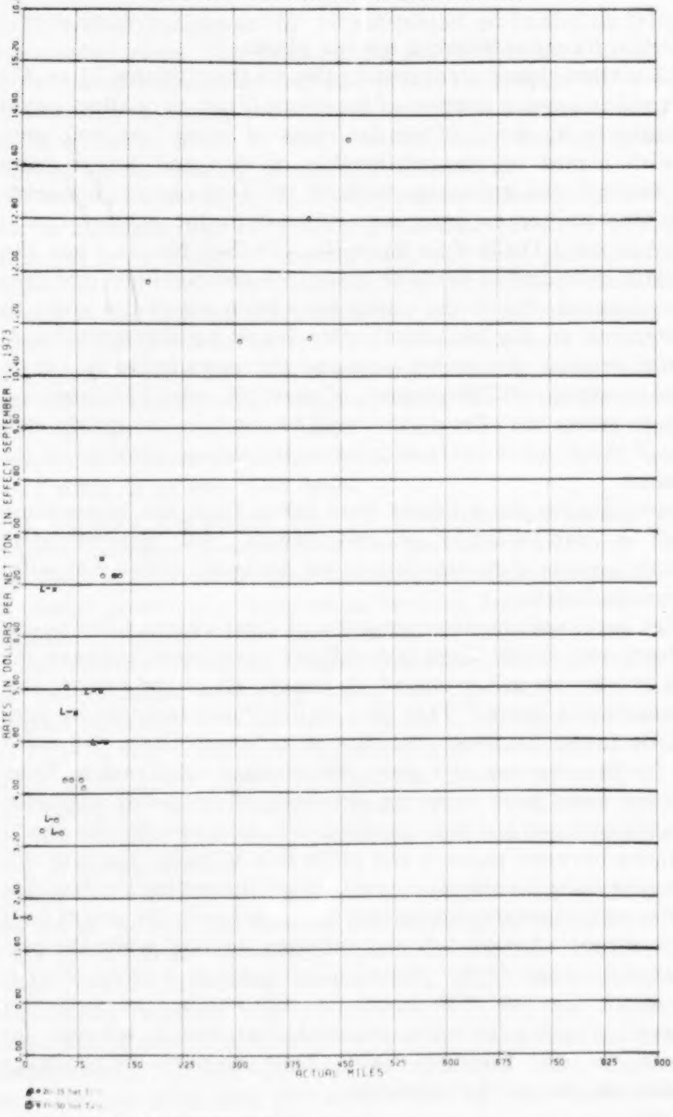
The 12 scatter charts presented in this section (figures 21 to 32) are designed to serve a number of functions. First, they allow visual comparisons to be made of similar types of scrap iron and steel traffic with regard to the relationship of rate and actual miles moved. Second, the groupings utilized in these charts, whenever possible, are similar to groupings utilized in the scatter charts presented in part 1(D)(5) of Ex Parte No. 270 (Sub-No. 5). Thus, the rate/mileage relationship between scrap iron and steel and iron ores may be compared. Third, the charts have been marked in order to bring attention to the individual rates found to return revenues below 100 percent of variable cost and the rates found to return revenues in excess of 230 percent of variable cost. This notation will help to assess the effects that could be made in the freight rate structure if the Coordinator's recommendations are adopted by the Commission.

The raw data for these charts were taken from the information provided in part I(D)(3) of this report. All representative movements presented by the parties for distances under 900 miles have been included.

In order to prevent misinterpretation of these charts, a few points should be noted. While there is a definite correlation between the rate and the actual miles moved in almost all of the charts, this correlation is not "pure." That is, a well-defined increase in rates will not be found for every increase in mileage. There are many reasons for the absence of a pure rate/mileage relationship. First, many of the rates were made on the basis of short-line distances between the shipper and the consignee. If, for example, the short-line distance between point A and point B is 50 miles, the rate will always be the same for the movement nothwithstanding the fact that the traffic, on various occasions, may move between the points over a number of routes having differing mileages. Second, while the per-car tonnage for each of the plotted movements in a given chart is similar, there may be differences in the number of switching movements or other services required that would account for differences in the line-haul rate. Thus a pure rate/mileage correlation should not be expected.

EXHIBIT 21

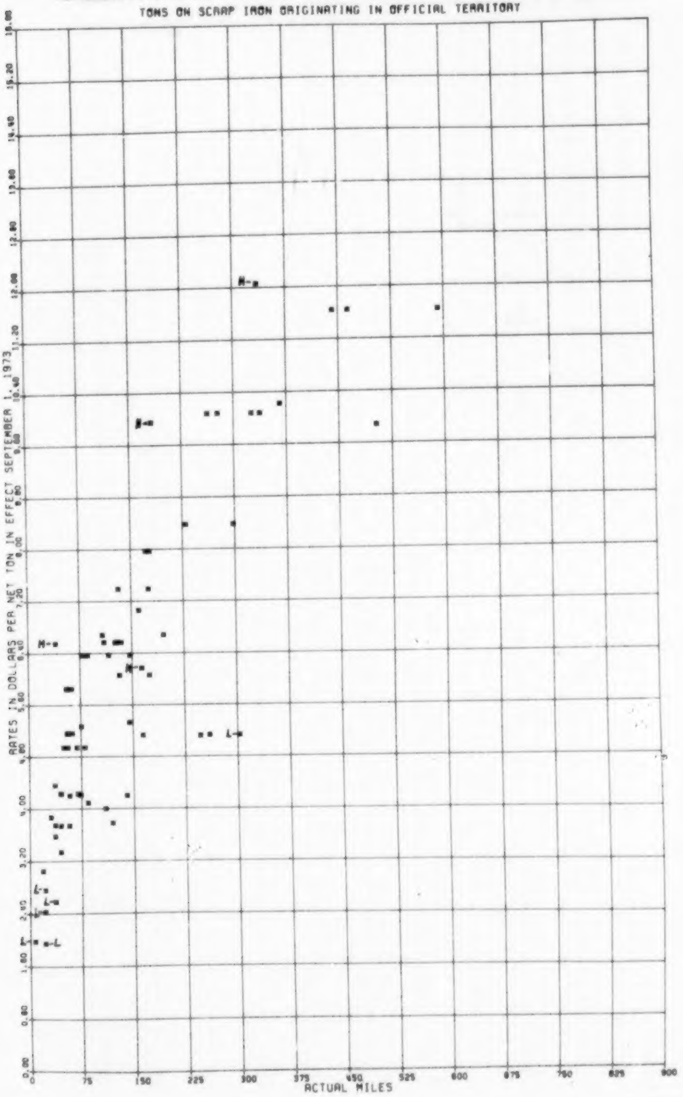
REPRESENTATIVE SINGLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 20 & 50 NET TONS ON SCRAP IRON ORIGINATING IN OFFICIAL TERRITORY



L= Rate returning revenue below 100 percent of variable cost.

FIGURE 23

REPRESENTATIVE SINGLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 50 & 65 NET TONS ON SCRAP IRON ORIGINATING IN OFFICIAL TERRITORY

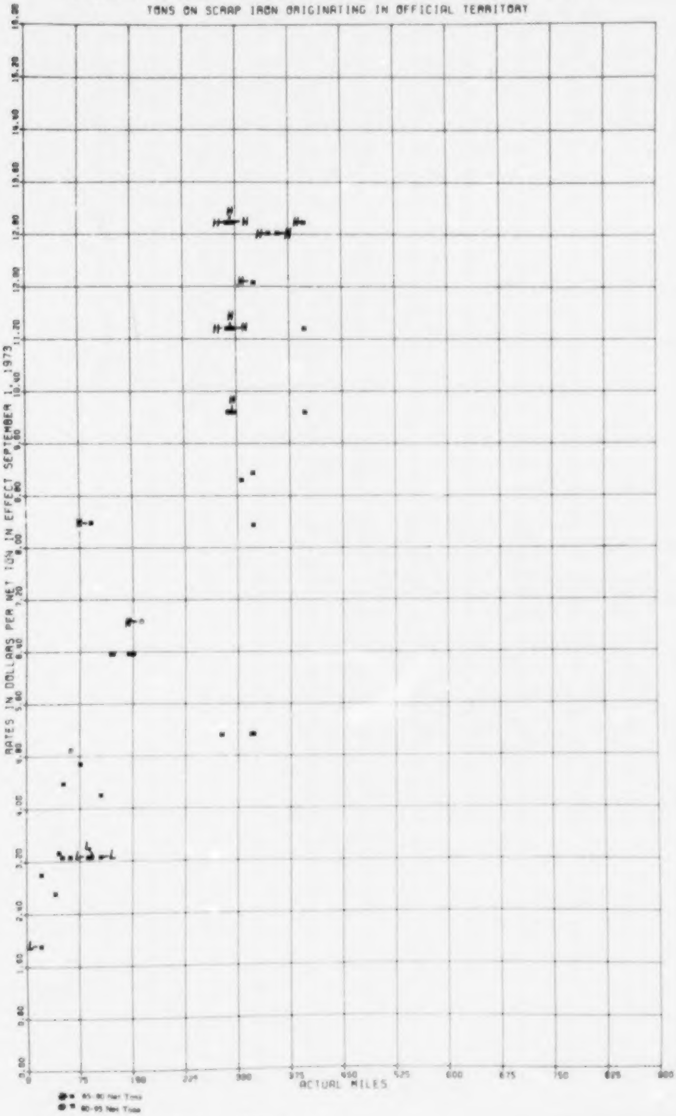


L = Rate returning revenue below 100 percent of variable cost.

H = Rate returning revenue in excess of 200 percent of variable cost.

FIGURE 21

REPRESENTATIVE SINGLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 65 & 125 NET TONS ON SCRAP IRON ORIGINATING IN OFFICIAL TERRITORY

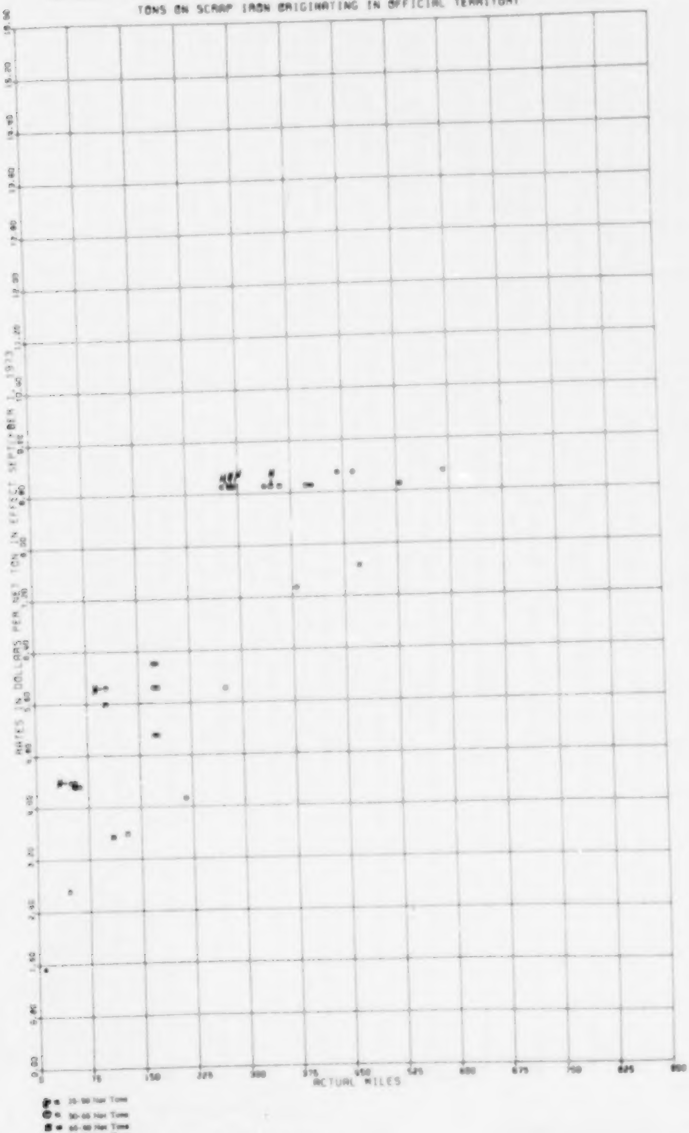


L* Rate returning revenue below 100 percent of variable cost

H* Rate returning revenue in excess of 230 percent of variable cost

FIGURE 24

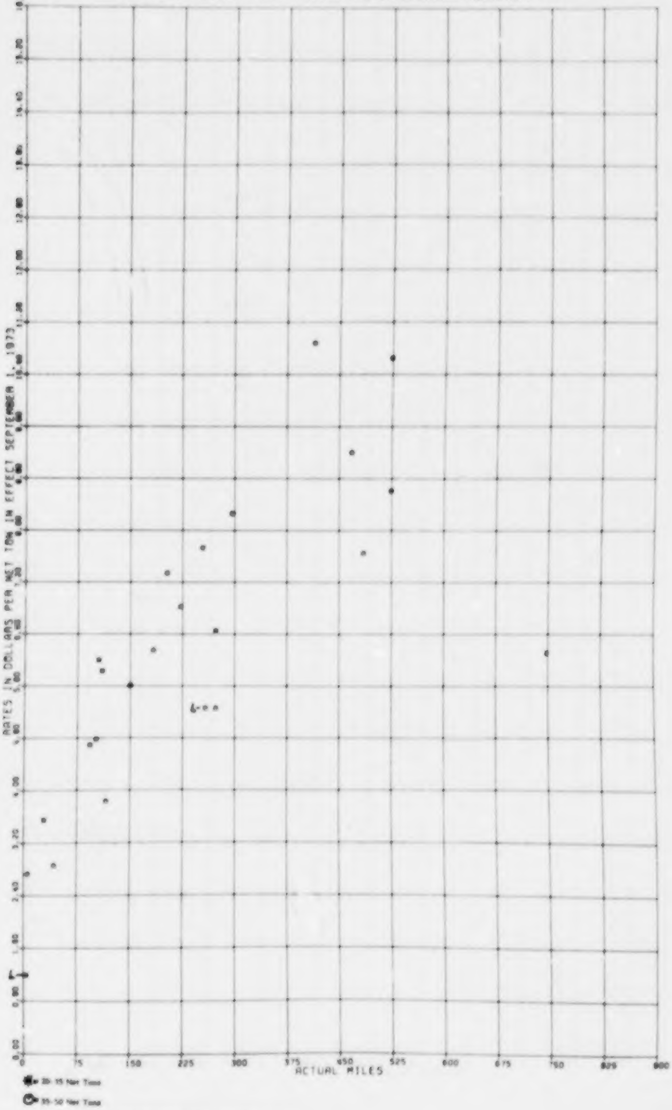
REPRESENTATIVE MULTIPLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 35 & 110 NET TONS ON SCRAP IRON ORIGINATING IN OFFICIAL TERRITORY



* Rate returning revenue in excess of 230 percent of variable cost.

FIGURE 26

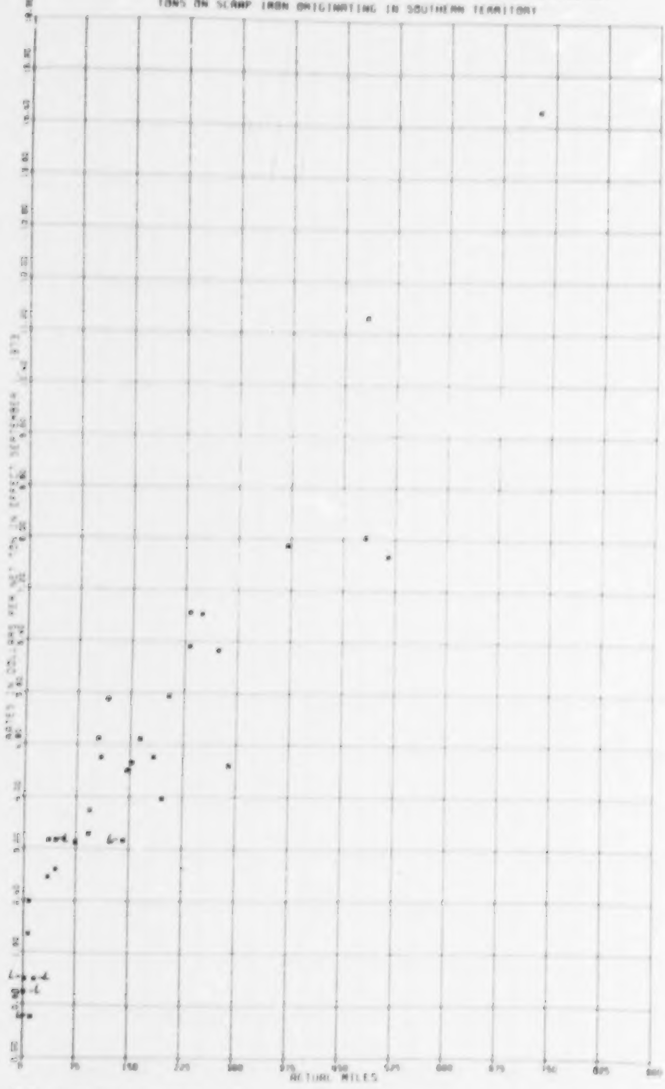
REPRESENTATIVE SINGLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 20 & 50 NET TONS ON SCRAP IRON ORIGINATING IN SOUTHERN TERRITORY



1/ Rate returning revenue below 100 percent of variable cost.

FIGURE [illegible]

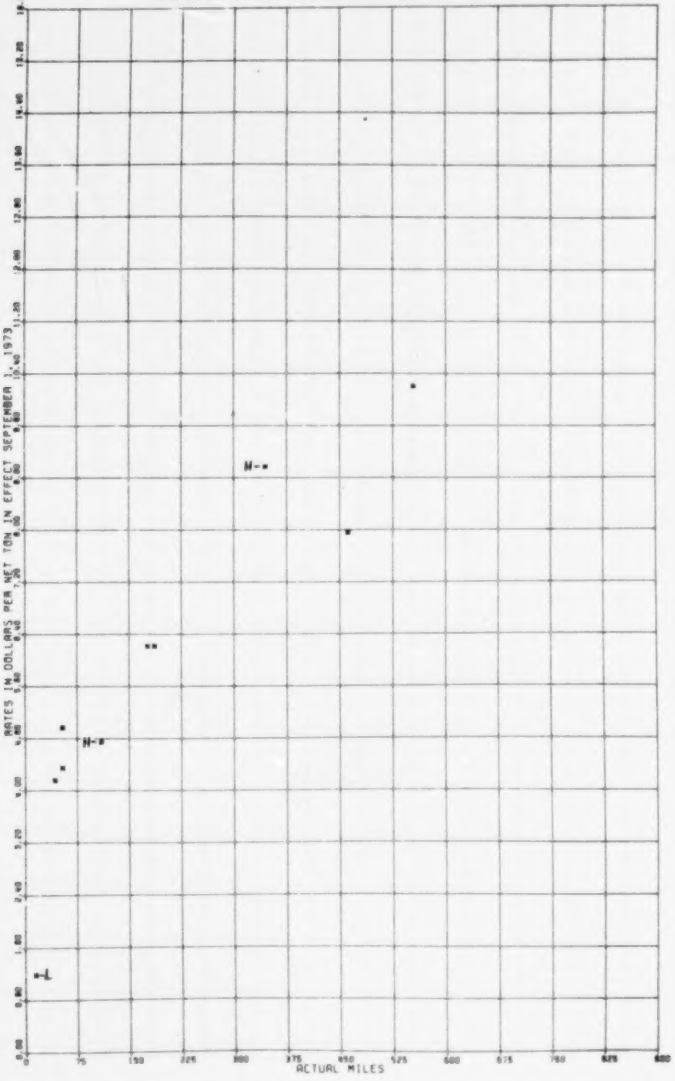
REPRESENTATIVE SINGLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 50 & 65 NET TONS ON SCRAP IRON ORIGINATING IN SOUTHERN TERRITORY



L- Rate returning revenue below 110 percent of variable cost.

FIGURE 27

REPRESENTATIVE SINGLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 65 & 125 NET TONS ON SCRAP IRON ORIGINATING IN SOUTHERN TERRITORY

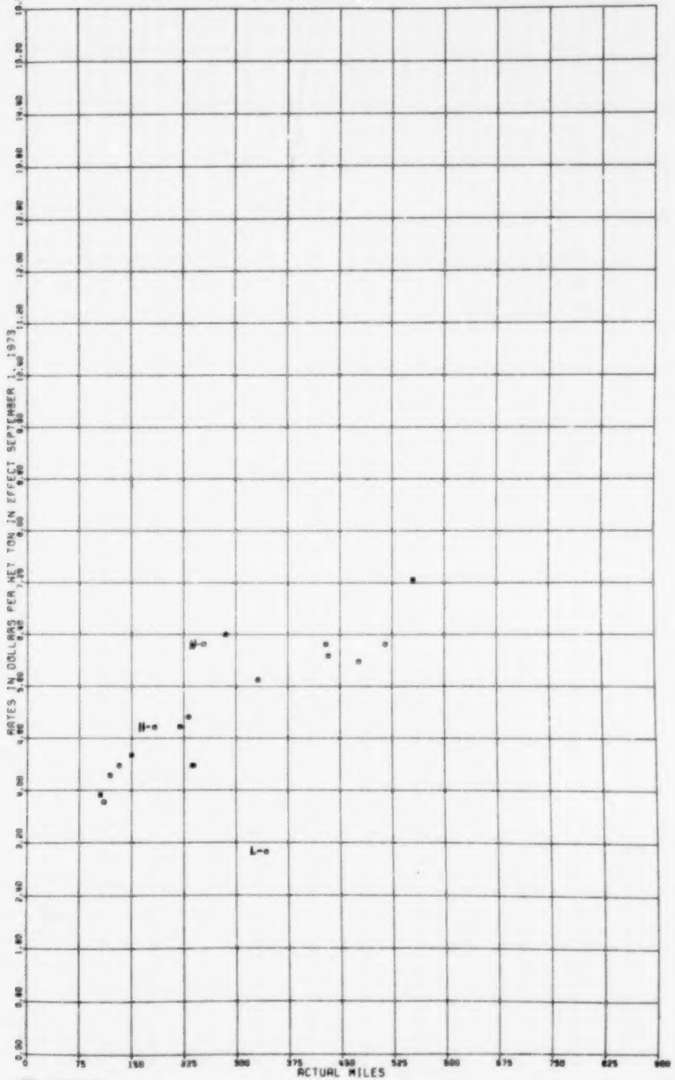


L- Rate returning revenue below 100 percent of variable cost.

H - Rate returning revenue in excess of 230 percent of variable cost.

FIGURE [illegible]

REPRESENTATIVE MULTIPLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 35 & 110 NET TONS ON SCRAP IRON ORIGINATING IN SOUTHERN TERRITORY



✱ = 35-50 Net Tons

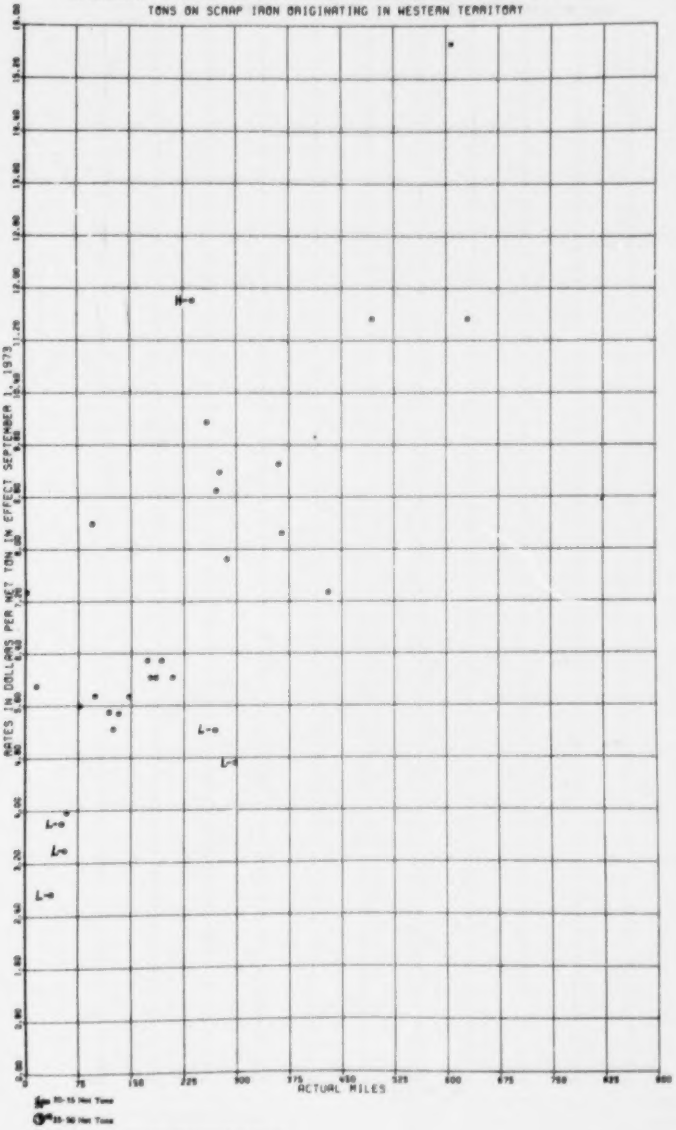
● = 50-65 Net Tons

L = Rate returning revenue below 100 percent of variable cost.

H = Rate returning revenue in excess of 330 percent of variable cost.

FIGURE [illegible]

REPRESENTATIVE SINGLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 20 & 50 NET TONS ON SCRAP IRON ORIGINATING IN WESTERN TERRITORY

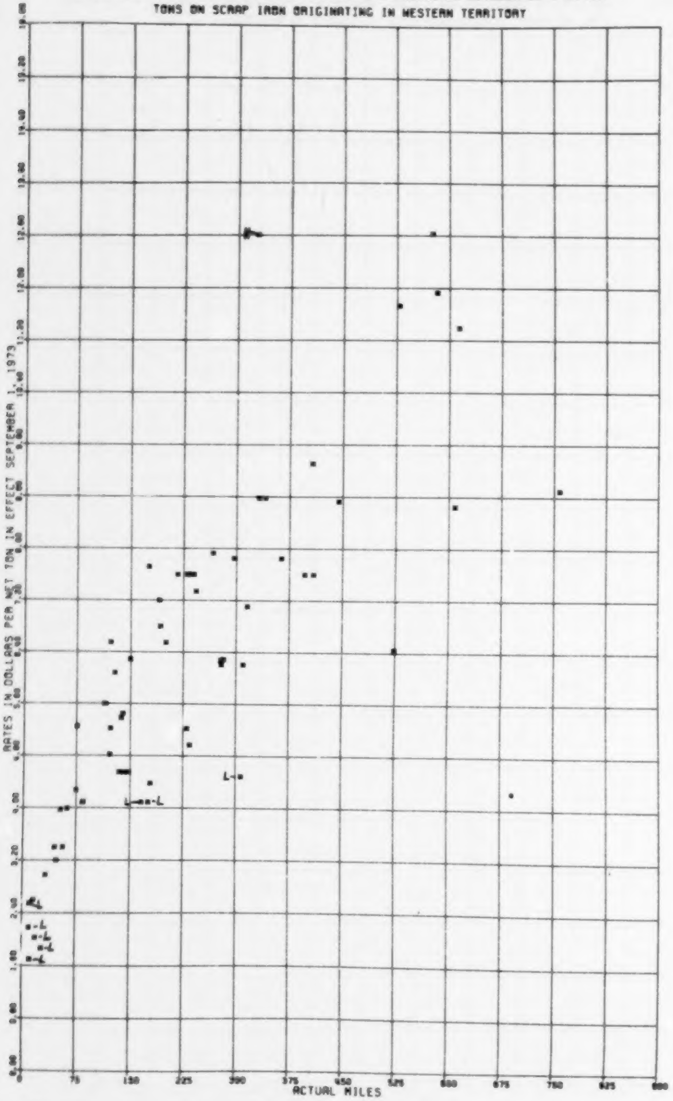


L- Rate returning revenue below 100 percent of variable cost.

H - Rate returning revenue in excess of 200 percent of variable cost.

FIGURE 30

REPRESENTATIVE SINGLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 50 & 65 NET TONS ON SCRAP IRON ORIGINATING IN WESTERN TERRITORY

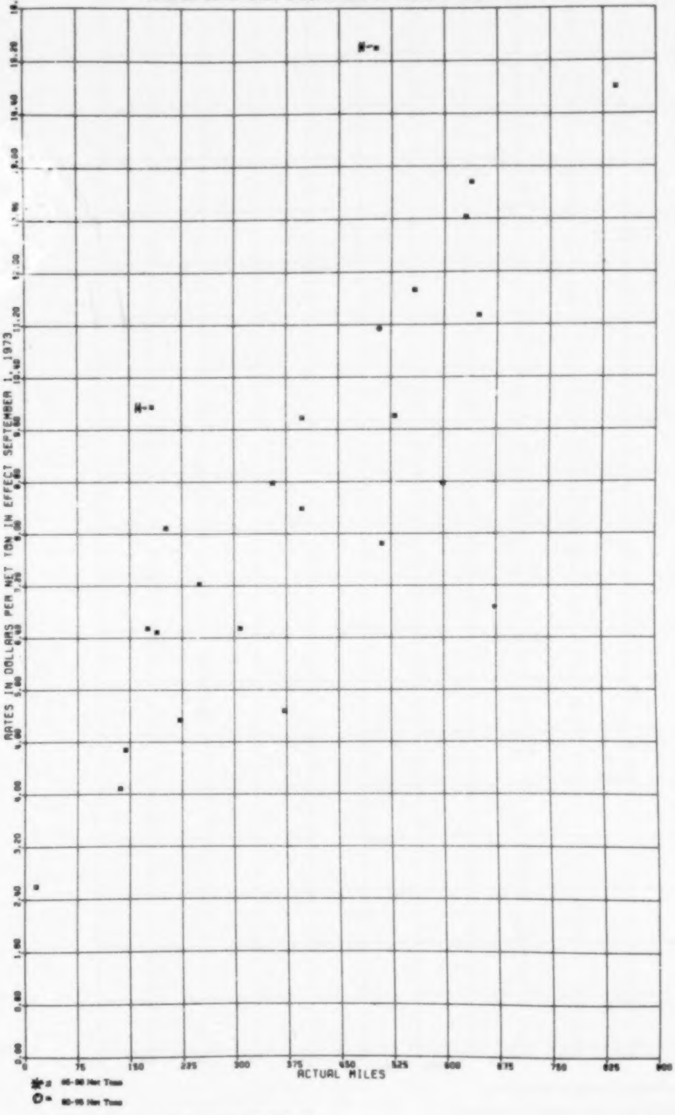


L= Rate returning revenue below 100 percent of variable cost.

H = Rate returning revenue in excess of 250 percent of variable cost.

FIGURE 31

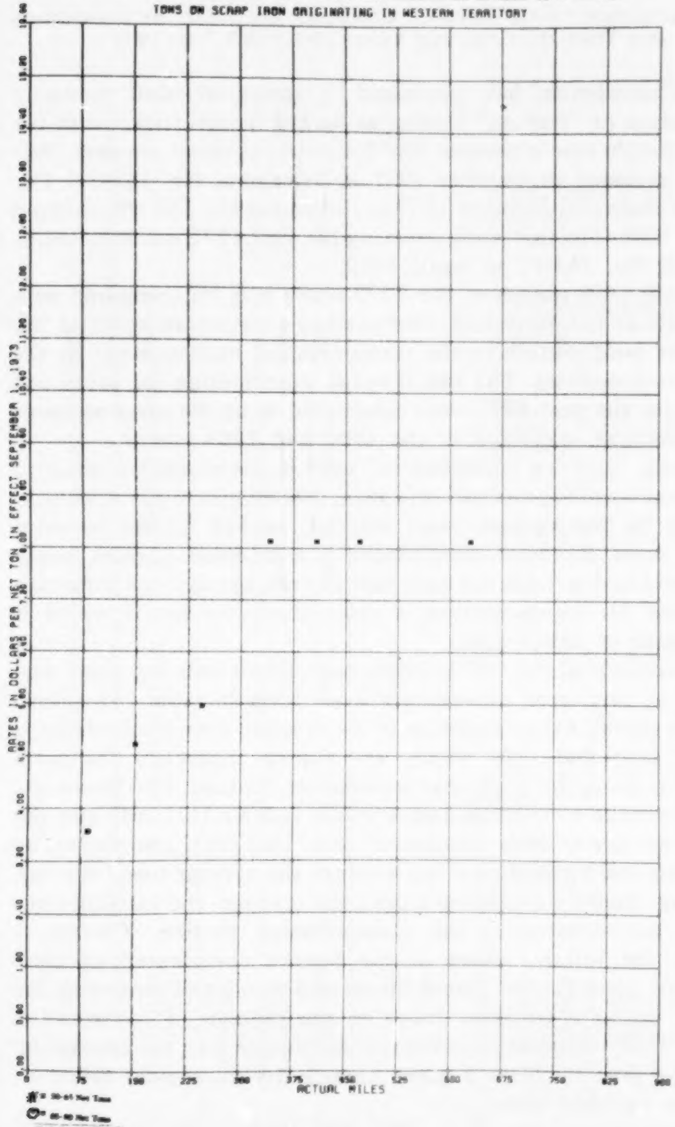
REPRESENTATIVE SINGLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 85 & 125 NET TONS ON SCRAP IRON ORIGINATING IN WESTERN TERRITORY



H = Rate returning revenue in excess of 330 percent of variable cost.

FIGURE 12

REPRESENTATIVE MULTIPLE CAR RATES ON ACTUAL CARLOADINGS BETWEEN 35 & 110 NET TONS ON SCRAP IRON ORIGINATING IN WESTERN TERRITORY



Part I(D)(6):

THE COMMISSION'S RAIL REVENUE CONTRIBUTION STUDY BY COMMODITY AND TERRITORY FOR THE YEARS 1966, 1969, AND 1972

The Commission has published a series of Rail Revenue Contribution or "Burden" Studies as part of its investigation of the railroad freight rate structure. The first study covered the year 1966 and was released in October 1971 as Statement No. 1S3-71. The second, released in October 1973 as Statement No. 1S3-69, covered the year 1969. The last study covering the year 1972 was released as Statement No. 1S3-72 in April 1975

Generally, the results of the 1972 study may be compared with the results of the 1966 and 1969 studies to measure shifts in the respective contribution to the transportation burden made by the various commodities. The rail revenue contribution for scrap and iron ore for the year 1972 was constructed using the same methods and procedures employed in the 1966 and 1969 studies.

The term "revenue contribution" used in these studies refers to the amount by which carload revenues, resulting from the structures in effect for the various years studied, exceed or fail to meet variable costs. Revenue contribution is a function of rates, costs, and volume and reflects not only cost factors, but also the influence of demand for transportation, a value-of-service factor which is independent of direct cost.

A breakdown of the 1972, 1969, and 1966 totals for scrap and iron ore by territorial movements is set forth in table 141 below. The most significant information is the revenue cost relationships in columns (10) and (11) which are shown separately for each commodity group by territorial movements. Column (10) shows the ratio of revenue to variable cost whereas column (11) indicates the ratio of revenue to fully allocated cost. This table also shows, by commodity and by territorial movements, the average load (in tons), the average haul (in short-line miles), the revenue, the variable cost, and the contribution to the transportation burden. Therein is reflected the relative share of the burden contributed by each commodity class for the United States as a whole and separately for each territorial movement. Items in the column of contribution marked "DEF" indicate the deficit contribution, i.e., the amount by which the revenue from a given commodity movement failed to cover the variable costs.

A comparison of the 1972, 1969, and 1966 results for iron and steel scrap, wastes and tailings, STCC 40211, reveals the following.

TABLE 141

Comparison of iron and steel scrap, waste and tailings

REVENUE CONTRIBUTION TO BURDEN AND OTHER DATA, BY COMMODITY CLASSES AND TERRITORIAL MOVEMENTS

(SOURCE OF TRAFFIC DATA: ONE-PERCENT WAYBILL SAMPLE)

STCC (1)	Commodity by territorial movement (2)	Carloads (3)	Tons (4)	Average load per car (5)	Average haul per ton (6)	Revenue (7)	Variable cost (8)	Contribution (9)	Ratio of revenue to variable cost (10)	Ratio of revenue to fully allocated cost (11)
				Tons	*Miles*				*Percent*	*Percent*
					1966					
40211	Iron and steel scrap, wastes and tailings									
	US TO US ------	4,982	264,156	53.0	144	$1,088,336	$702,171	$386,165	155.0	132.7
	OFF TO OFF ---	3,590	194,375	54.1	110	736,373	483,268	253,105	152.4	131.7
	SOU TO SOU --	329	17,145	52.1	153	64,429	32,796	31,633	196.5	165.8
	WST TO WST --	985	48,830	49.6	239	247,531	163,389	84,142	151.5	127.3
	OFF TO SOU --	18	930	51.7	485	8,183	4,153	4,030	197.0	159.9
	SOU TO OFF --	33	1,736	52.6	432	15,331	7,278	8,053	210.6	172.1
	OFF TO WST --	6	293	48.8	828	3,276	2,385	891	137.4	112.4
	WST TO OFF --	11	417	37.9	1,479	8,588	6,497	2,091	132.2	109.9
	WST TO SOU --	7	318	45.4	358	2,487	1,239	1,248	200.7	167.0

Comparison of iron and steel scrap, waste and tailings—Continued

REVENUE CONTRIBUTION TO BURDEN AND OTHER DATA, BY COMMODITY CLASSES AND TERRITORIAL MOVEMENTS—Continued

(SOURCE OF TRAFFIC DATA: ONE-PERCENT WAYBILL SAMPLE)—Continued

STCC (1)	Commodity by territorial movement (2)	Carloads (3)	Tons (4)	Average load per car (5)	Average haul per ton (6)	Revenue (7)	Variable cost (8)	Contribution (9)	Ratio of revenue to variable cost (10)	Ratio of revenue to fully allocated cost (11)
				Tons	*Miles*				*Percent*	*Percent*
					1969					
40211	Iron and steel scrap, wastes and tailings									
	US TO US -----	5,470	298,690	54.6	150	$1,344,260	$1,021,574	$322,686	131.6	114.0
	OFF TO OFF -	3,775	209,420	55.5	108	870,975	682,724	188,251	127.6	112.0
	SOU TO SOU -	480	25,905	54.0	166	113,865	64,173	49,692	177.4	150.9
	WST TO WST -	1,095	56,690	51.8	219	267,210	217,312	49,898	123.0	104.6
	OFF TO SOU -	50	3,315	66.3	393	29,655	13,493	16,162	219.8	176.4
	SOU TO OFF -	10	410	41.0	233	3,035	1,810	1,225	167.7	146.0
	OFF TO WST -	35	1,810	51.7	1,277	32,850	23,244	9,606	141.3	114.1
	WST TO OFF -	20	995	49.8	1,553	22,225	16,018	6,207	138.8	112.5
	SOU TO WST -	5	145	29.0	1,472	4,445	2,800	1,645	158.8	136.8

Comparison of iron and steel scrap, waste and tailings—Continued

REVENUE CONTRIBUTION TO BURDEN AND OTHER DATA, BY COMMODITY CLASSES AND TERRITORIAL MOVEMENTS—Continued

(SOURCE OF TRAFFIC DATA: ONE-PERCENT WAYBILL SAMPLE)—Continued

STCC (1)	Commodity by territorial movement (2)	Carloads (3)	Tons (4)	Average load per car (5)	Average haul per ton (6)	Revenue (7)	Variable cost (8)	Contribution (9)	Ratio of revenue to variable cost (10)	Ratio of revenue to fully allocated cost (11)
				Tons	*Miles*				*Percent*	*Percent*
					1972					
40211	Iron and steel scrap, wastes and tailings									
	US TO US-----	4,766	266,549	55.9	147	$1,416,592	$1,090,322	$326,270	129.9	103.4
	OFF TO OFF-	3,347	190,732	57.0	107	933,188	747,303	185,885	124.9	100.7
	SOU TO SOU-	474	24,915	52.6	153	121,608	74,174	47,434	163.9	128.7
	WST TO WST-	809	43,292	53.5	224	256,214	200,337	55,877	127.9	99.0
	OFF TO SOU-	30	1,891	63.0	536	21,965	12,050	9,915	182.3	135.8
	SOU TO OFF-	49	2,593	52.9	344	23,810	15,719	8,091	151.5	120.4
	OFF TO WST-	34	2,073	61.0	1,167	38,358	26,528	11,830	144.6	107.8
	WST TO OFF-	9	401	44.6	1,378	10,379	7,298	3,081	142.2	110.9
	SOU TO WST-	11	474	43.1	944	9,195	5,999	3,196	153.3	121.2

Comparison of iron ore

REVENUE CONTRIBUTION TO BURDEN AND OTHER DATA, BY COMMODITY CLASSES AND TERRITORIAL MOVEMENTS

(SOURCE OF TRAFFIC DATA: ONE-PERCENT WAYBILL SAMPLE)

STCC (1)	Commodity by territorial movement (2)	Carloads (3)	Tons (4)	Average load per car (5)	Average haul per ton (6)	Revenue (7)	Variable cost (8)	Contribution (9)	Ratio of revenue to variable cost (10)	Ratio of revenue to fully allocated cost (11)
				Tons	*Miles*				*Percent*	*Percent*
					1966					
10100	Iron ores									
	US TO US -----	*17,103	1,295,121	75.7	139	$2,132,349	$1,468,854	$663,495	145.2	105.0
	OFF TO OFF-	6,136	483,013	78.7	174	1,069,876	637,057	432,819	167.9	121.0
	SOU TO SOU-	336	24,037	71.5	192	45,782	38,892	6,890	117.7	93.8
	WST TO WST-	10,431	771,898	74.0	107	944,765	750,345	194,420	125.9	91.2
	WST TO OFF-	182	14,787	81.2	547	65,996	38,897	27,099	169.7	115.2
	WST TO SOU-	16	1,241	77.6	455	5,174	3,130	2,044	165.3	120.1
					1969					
10100	Iron ores*									
	US TO US -----	20,350	1,550,600	76.2	237	3,549,700	3,525,796	23,904	100.7	76.8
	OFF TO OFF--	4,750	368,550	77.6	189	848,450	931,608	83,158DEF	91.1	72.9
	SOU TO SOU--	500	41,000	82.0	170	74,100	71,568	2,532	103.5	82.9

Comparison of iron ore—Continued

REVENUE CONTRIBUTION TO BURDEN AND OTHER DATA, BY COMMODITY CLASSES AND TERRITORIAL MOVEMENTS—Continued

(SOURCE OF TRAFFIC DATA: ONE-PERCENT WAYBILL SAMPLE)—Continued

STCC (1)	Commodity by territorial movement (2)	Carloads (3)	Tons (4)	Average load per (5)	Average haul per ton (6)	Revenue (7)	Variable cost (8)	Contribution cost (9)	Ratio of revenue to variable cost (10)	Ratio of revenue to fully allocated cost (11)
				Tons	*Miles*				*Percent*	*Percent*
					1969—Continued					
10100	Iron ores—Con.									
	WST TO WST--	14,450	1,089,350	75.4	254	$ 2,465,550	$ 2,395,681	$ 69,869	102.9	77.0
	OFF TO SOU--	600	47,450	79.1	247	137,550	103,436	34,114	133.0	101.7
	WST TO OFF--	50	4,250	85.0	688	24,050	23,503	547	102.3	78.0
					1972					
10100	Iron ores*									
	US TO US ------	12,799	1,016,505	79.4	119	1,985,228	1,957,548	27,680	101.4	66.7
	OFF TO OFF--	4,267	356,573	83.6	153	981,754	897,356	84,398	109.4	76.4
	SOU TO SOU--	140	11,259	80.4	225	29,342	27,109	2,233	108.2	76.3
	WST TO WST--	8,275	638,837	77.2	95	930,259	1,002,575	72,316DEF	92.8	57.8
	OFF TO SOU--	107	8,836	82.6	298	38,105	27,292	10,813	139.6	96.2
	WST TO SOU--	8	802	100.3	478	4,409	2,540	1,869	173.6	108.3

The vast majority of all scrap traffic originated and terminated in official territory. For example, in 1972, 70 percent or 3,347 of the 4,766 scrap carloads sampled both originated and terminated in the official territory. In addition, 64 carloads originated in the official territory and terminated in one of the remaining territories and another 58 carloads originated in one of the other territories but terminated in the official territory. In all, 73 percent of the scrap carloads sampled originated and/or terminated in the official territory in 1972. The same situation also held true with respect to the years 1969 and 1966 wherein 71 and 73 percent of all scrap carloads originated and/or terminated in the official territory, respectively.

In 1972, 11 percent of all scrap carloads originated in the southern and 17 percent in western territory. The percentage of scrap traffic originating in the southern territory increased slightly from 1966 to 1972, with total carloads increasing approximately 4 percent during this period. Scrap traffic originating in the western territory, however, declined approximately 3 percent from 1966 to 1972.

As can be seen, the vast majority of all scrap carloads sampled for each of the study years terminated in the territory in which they originated. For example, of the total 15,218 scrap carloads sampled in 1966, 1969, and 1972, only 328 carloads terminated in a different territory than they originated in.

In comparing the results for 1972, 1969, and 1966 in terms of scrap tonnage handled, it can be seen that total tons increased from 264,156 tons in 1966 to 298,690 tons in 1969. However, in 1972 total scrap tons carried declined to 266,549. This trend was true with respect to tons originating in the official and western territories, whereas the southern territory experienced an increase in tons carried over the same period. Tons originating in the southern territory increased from 18,881 tons in 1966, to 26,460 tons in 1969, and to 27,982 tons in 1972.

The average intraterritory average length of haul per ton (miles) remained relatively constant for the 3 years studied. As would be expected the western territory experienced the longest average hauls. The average distance on movements from the western to official territory did decline 11 percent in 1972 as did movements from the southern to the western territory and from the official to western territory which declined 36 and 9 percent, respectively. It should be noted, however, that these movements account for only 1 percent of total carloads handled in 1972.

For the 3 years studied, the average load per car increased from a U.S. average of 53.0 tons in 1966 to 55.9 tons in 1972, an increase of 5.47 percent.

The revenue contribution declined since 1966. For example, as evidenced by table 142 below, the revenue contribution for all U.S. scrap traffic sampled has declined from 155.0 percent in 1966 to 131.6 percent in 1969, to 129.9 percent in 1972, a decrease of 25 percentage points.

TABLE 142

Decline in scrap revenue contribution

Scrap territory	Ratio of revenue to variable costs		
	1966	1969	1972
		Percent	
U.S. to U.S.	155.0	131.6	129.9
Official to official	152.4	127.6	124.9
Southern to southern	196.5	177.4	163.9
Western to western	151.5	123.0	127.9

A comparison of the revenue contribution for intraterritory movements indicates that marked declines were experienced in the official, southern, and western territories. Their revenue contribution in the official territory decreased 28 percentage points in 1972 over 1966, whereas the southern and western territories experienced a decline of 33 and 24 percentage points, respectively. While southern territory's revenue contribution in 1972 was less than in 1966, there was nevertheless an increase of 5 percentage points over 1969. The southern territory has consistently had the most favorable revenue contribution. For example, in 1972 southern's revenue contribution was 34 percentage points higher than the U.S. average.

An analysis of the revenue per car-mile and per ton-mile for scrap reveals that both have increased over the 6-year period with revenue per car-mile showing the largest increase. The results of this analysis shown in tables 143 and 144 below indicate that from 1966 to 1972 revenue per car-mile for all U.S. movements increased 33 percent while during the same period revenue per ton-mile for all U.S. movements increased by 27 percent. Revenue per ton-mile in the official territory, which accounts for the bulk of the traffic, increased 33 percent in 1972 over the revenue per ton-mile for 1966 for intraterritory movements. The southern and western territories also showed slight increases in revenue per ton-mile, though not as large as the official territory.

TABLE 143

Territorial movement	Iron and steel scrap (sub 6)					
	Revenue per car-mile			Revenue per ton-mile		
	1966	1969	1972	1966	1969	1972
US to US	$1.5170	$1.6383	$2.0220	$.0286	$.0300	$.0362
Off. to Off	1.8647	2.1363	2.6057	.0344	.0385	.0457
Sou. to Sou	1.2800	1.4290	1.6768	.0246	.0265	.0319
West to West	1.0515	1.1143	1.4139	.0212	.0215	.0264
Off. to Sou	.9373	1.5092	1.3660	.0181	.0228	.0212
Sou. to Off	1.0754	1.3026	1.4126	.0204	.0318	.0267
Off. to West	.6594	.7350	.9667	.0135	.0142	.0159
West to Off	.5279	.7156	.8369	.0139	.0144	.0188
Sou. to West	------	.6039	.8855	------	.0208	.0205
West. to Sou	.9924	------	------	.0218	------	------

TABLE 144

Territorial movement	Iron ores (Sub 5)					
	Revenue per car-mile			Revenue per ton-mile		
	1966	1969	1972	1966	1969	1972
US to US	$.8970	$.7360	$1.3034	$.0120	$.0100	$.0160
Off. to Off	1.0021	.9451	1.5038	.0127	.0122	.0180
Sou. to Sou	1.0197	.8718	.9315	.0099	.0106	.0116
West to West	.8465	.6718	1.1833	.0114	.0090	.0153
West to Off	.6629	.6991	------	.0082	.0082	------
West to Sou	.7107	------	1.1530	.0092	------	.0115
Off. to Sou	------	.9281	1.1950	------	.0117	.0145

A comparison of the 1972, 1969, and 1966 results for iron ore traffic, STCC 10100, reveals that the traffic is more evenly distributed between the official and western territories. The bulk of the traffic, both in terms of carloads and tons, originates and terminates in the western territory. The western territory originated and/or terminated 65 percent of the total carloads of iron ore traffic in 1972. Whereas 72 percent of the total carloads of scrap originated and/or terminated in the official territory in 1972, only 34 percent of the total iron ore carloads originated and/or terminated in the official territory.

As with scrap, the U.S. volume of iron ore traffic increased from 1966 to 1969 and then declined in 1972. In 1969, 1,550,600 tons of iron ore were reported compared to only 1,016,505 tons of iron ore in 1972, a decrease of 34 percent under the 1969 level and 21 percent below the 1966 level of 1,293,121 tons. This is a larger percentage decline than scrap experienced, which in 1972 remained slightly above its 1966 volume level.

By comparison the U.S. average iron ore load per car increased, as shown in table 16, from 75.7 tons in 1966 to 79.4 tons in 1972, an increase of 4.89 percent which is comparable with the 5.47 percent increase experienced in scrap loads.

The U.S. average length of haul for iron ore also increased in 1969 to 237 miles, up considerably from the 1966 level of 139 miles. However, in 1972 the average length of haul declined to 119 miles, 20 miles below its 1966 level. The most notable cause of this fluctuation was an increase in the average length of haul experienced by the western territory, which jumped from 107 miles in 1966 to 254 miles in 1969 and then decreased to 95 miles in 1972. As noted previously in this report, this may have been caused by the deficiencies discovered in the 1969 waybill data.

The most apparent contrast between scrap and iron ore can be found in comparing the revenues and revenue contribution of the two commodities. In the case of scrap the total revenue increased in each succeeding year despite a decrease in traffic volume from 1969 to 1972. This, however, was not the case with iron ore which experienced a decline in both volume and total revenues.

While total revenues for iron ore declined, variable cost continued to rise. For instance, in 1966, 483,013 tons of iron ore were shipped intraterritorially in the official territory at a variable cost of $637,057. In 1972, 356,573 tons of iron ore were shipped intraterritorially in the official territory at a variable cost of $897,358, an increase of 40.86 percent over 1966 variable cost. This rising variable cost reduced the revenue contribution ratio on iron ore significantly over the 6-year period. In 1966 the revenue contribution ratio for all U.S. movements was 145.2 percent; in 1969 it was 100.7 percent, despite an increase in traffic volume, and in 1972 it was 101.4 percent. Although, as noted earlier, the revenue contribution ratio for scrap has shown a similar decrease over the same 6-year period, it still remained at 129.9 percent in 1972 for all U.S. movements, which is considerably higher than the 100.7 percent revenue contribution ratio experienced for all U.S. iron ore movements.

It should also be noted at this point that in 1969 intraterritory movements of iron ore in the official territory operated at a deficit as did iron ore movements in the western territory in 1972. In no instance did scrap move at a loss for the 3 years studied.

In comparing the revenue per car-mile and revenue per ton-mile for iron ore movements, it is found in most cases that revenues per car-mile and ton-mile increased in each succeeding year. For all U.S. movements of iron ore, the revenue per car-mile increased 45 percent from 1966 to 1972 while the revenue per car-mile increased from 1966 to 1972 by 33 percent. The largest absolute increase in revenue per car-mile, for intraterritory iron ore movements, was experienced by the official territory which increased 50 percent. The largest absolute increase in revenue per ton-mile for intraterritory iron ore movements was experienced in the western territory which increased 34 percent in 1972 as compared with 1966. This was closely followed by the official territory which experienced a 27-percent increase in the revenue per ton-mile.

A comparison between the revenue per ton-mile and the revenue per car-mile for both scrap in this proceeding and iron ore Ex Parte No. 270 (Sub-No. 5) reveals that scrap has the higher revenue contribution. For instance, in 1972 the revenue per car-mile for all U.S. movements of scrap was $2.0220 while the revenue per car-mile for all U.S. movements of iron ore was $1.3043. Likewise revenue per ton-mile for all U.S. scrap movements in 1972 was $0.0290 compared to $0.0160 per ton-mile for iron ore.

In summary, based on the results shown in Burden Studies for 1966, 1969, and 1972, the Coordinator finds that both iron ore and scrap have experienced large increases in variable cost and reduced revenue per car. Although revenues per ton-mile and per car-mile have generally increased for both commodities the increase has not been enough to cover the increases in variable cost and has thus led to a lower revenue contribution. As noted above, scrap has the higher revenue contribution of the two commodities yielding a revenue contribution ratio for all U.S. scrap movements of 129.9 percent in 1972 as compared with 101.4 percent for all iron ore movements. Although both commodities experienced an increase in traffic volume between 1966 and 1969, followed by a decrease in volume in 1972, iron ore traffic declined considerably more than scrap, actually falling below its 1966 volume. The continuation of decreasing volume and reduced revenue contribution has decreased the contribution for all scrap movements sampled from $386,165 in 1966 to $326,270 in 1972. Likewise, the contribution for all iron ore movements sampled has decreased from $663,495 in 1966 to $27,680 in 1972. This, of course, is not the total dollar contribution for all scrap and iron ore traffic but the contribution based on the 1-percent waybill sample.

This discussion of the "Burden Study" results for scrap and iron ore for the years 1966, 1969, and 1972 is provided for general information in addition to the cost-revenue comparisons for the representative movements furnished by the parties in part I(D)(3). There may be an inclination on the part of some individuals to make a comparison of the "Burden Study" results with the results derived from the previously submitted cost-revenue comparison. Some differences in the results of the two studies exist. However, the Coordinator is of the opinion that it is impossible to draw any meaningful comparison between the Burden Study results and those for the representative movements submitted by the railroads.

First, the "Burden Study" is based upon a 1-percent waybill sample of rail traffic in the United States and is implicitly reflective of all rail freight traffic on a proportional basis. On the other hand, the movements submitted by the railroads were not based on any sampling procedures. The selection of "representative movements" was left to the discretion of each party. As a result, the representativeness of the movements submitted by the railroads cannot be verified. Nevertheless, the various parties have had the opportunity to contest the representativeness of these scrap and iron ore movements, but no such contentions have been made.

Another reason for the differences in the two studies is that the costs developed in the "Burden Study" are based on broad averages, whereas costs developed for representative movements are based on additional refinements not utilized in the Burden Study such as actual route of movement miles broken down by regions, weight of individual shipments, number of interchanges, specific type of shipment, et cetera.

Moreover, the revenues and costs for the representative movements are at the September 1973 rate and cost level, whereas the latest Burden Study is for the year 1972 with the rates and costs at the mid-1972 level.

In summary, assuming the representative movements are, in fact, representative of scrap iron and steel and iron ore traffic, an assumption not questioned on the record by any party, the Coordinator believes that primary reliance in these proceedings should be accorded to the revenue/cost comparison for the representative movements submitted by the parties.

Part I(D)(7): Financial data of involved railroads.

While previous sections have made no attempt to differentiate among the territories in terms of relative amounts of scrap iron and steel movements, it is important in terms of an accurate overview to note the total dollar figures involved in the movements considered as well as differences between the territories and the involved railroads. Annual statistics compiled in *Freight Commodity Statistics, Class I Railroads in the United States,* Interstate Commerce Commission, Bureau of Accounts, are the primary source for the following information.

Tables 145 through 148 present the total tonnages originated, the total revenue, and the average revenue per originated ton for the United States, eastern territory, southern territory, and western territory for the years 1966 through 1973. Figures showing the percentage of total U.S. revenue earned by railroads in the three territories for the same time period are found in table 149.

As shown in table 145, the effects of general freight rate increases and increased demand for scrap during the period considered combined to make the movement of scrap almost a $200 million a year business in 1973. Originated tons increased by 6,076,172 per year or 22.2 percent and the revenue per originated ton increased by $1.59 or 37.9 percent.

A comparison of tables 146, 147, and 148 indicates that there are significant differences in the average revenue per originated tons in each of the territories. Eastern territory, which always accounts for the majority of revenues earned, shows average revenues per originated ton that are consistently lower than the national average.[17] Southern territory revenues come closest to approximating the national average while western territory revenues uniformly exceed the average by significant amounts.

---

[17] It should be noted that revenues shown in table 2, taken from *Freight Commodity Statistics, supra,* are significantly higher than revenues shown in appendix A of the verified statement of Roger F. Scanlan on behalf of respondent Eastern Territory Railroads. No explanation is available for the differences.

TABLE 145

Originations and revenue, iron and steel scrap, wastes and tailings, STCC 40211, 1966-1973, United States

Year	Originated tons	Total revenue	Revenue per originated (net) ton
1966	27,395,912	$114,954,443	$4.20
1967	25,469,377	106,602,303	4.19
1968	26,716,415	115,250,558	4.31
1969	29,672,820	129,656,470	4.37
1970	28,183,281	136,404,346	4.84
1971	26,608,750	145,752,993	5.48
1972	28,488,197	157,305,295	5.52
1973	33,472,084	193,681,000	5.79

TABLE 146

Originations and revenue, iron and steel scrap, wastes and tailings, STCC 40211, 1966-1973, Eastern Territory

Year	Originated tons	Total revenue	Revenue per originated (net) ton
1966	18,348,062	$71,651,155	$3.91
1967	16,554,122	65,043,502	3.93
1968	17,595,690	72,331,190	4.11
1969	19,386,411	79,912,210	4.12
1970	17,058,502	76,594,876	4.49
1971	16,646,819	83,705,328	5.03
1972	17,617,316	91,291,763	5.18
1973	20,501,775	110,865,000	5.41

TABLE 147

Originations and revenue, iron and steel scrap, wastes and tailings, STCC 40211, 1966-1973, Southern Territory

Year	Originated tons	Total revenue	Revenue per originated (net) ton
1966	2,075,362	$9,068,369	$4.37
1967	2,210,672	9,140,251	4.13
1968	2,378,694	10,289,677	4.33
1969	2,816,445	12,069,392	4.29

Originations and revenue, iron and steel scrap, wastes and tailings, STCC 40211, 1966-1973, Southern Territory—Continued

Year	Originated tons	Total revenue	Revenue per originated (net) ton
1970	3,173,320	$15,307,950	$4.82
1971	3,142,747	17,656,577	5.62
1972	3,457,399	18,790,389	5.43
1973	3,967,114	21,652,000	5.46

TABLE 148

Originations and revenue, iron and steel scrap, wastes and tailings, STCC 40211, 1966-1973, western territory

Year	Originated tons	Total revenue	Revenue per originated (net) ton
1966	6,972,488	$34,216,919	$4.91
1967	6,704,583	32,418,550	4.84
1968	6,472,031	32,629,691	5.04
1969	7,496,964	37,674,868	5.03
1970	7,951,459	4,501,520	5.60
1971	6,819,184	44,391,088	6.51
1972	7,413,482	47,223,143	6.37
1973	9,003,195	61,164,000	6.79

Table 149 seems to indicate a shifting pattern in the percentage of revenues earned by carriers in the three territories. Eastern carriers show the only decreases, from the low 60's in the late 1960's to the high 50's in the early 1970's. Western carriers show marginal increases from the very high 20's in the 1960's to the very low 30's in the early 1970's. Southern carriers, while still earning the smallest percentage, show the largest increases. The 1973 earnings for southern carriers more than doubled the 1966 earnings and their percentage of total U.S. revenues increases by almost 42 percent. It is impossible to make an accurate prediction of future trends in scrap production from the data currently available, but it does appear from the figures presented in these tables that the scrap industry is growing at a faster rate in the southern territory than in either the eastern or the western. However, eastern territory with 61.3 percent of the originated tonnage and 57.2 percent of the total revenue must be considered the most significant region for the movement of iron and steel scrap as well as iron ores. See Ex Parte No. 270 Sub-No. 5.

TABLE 149

Percentage of total U.S. revenue from movements of iron and steel scrap, wastes and tailings, STCC 40211, received by eastern, southern, and western territory railroads, 1966-1973

Year	Eastern territory	Southern territory	Western territory
1966	62.3	7.9	29.8
1967	61	8.6	30.4
1968	62.8	8.9	28.3
1969	61.6	9.3	29.1
1970	56.2	11.2	32.6
1971	57.4	12.1	30.5
1972	58	12	30
1973	57.2	11.2	31.6

While 1966 was chosen as the base year for the comparisons made in tables 145 through 149, a different picture is shown when 1958 is chosen as the base year. The Southern has presented an excellent series of comparisons utilizing the latter year and, for purposes of completeness, these comparisons are shown in tables 150 through 152 and figures 33 through 36. It is clear that 1958 was chosen because of high revenues per originated net ton, but it is felt that the comparisons are valid to the extent that they demonstrate the combined effects of rate reductions due to increased minimum weights, general freight rate increases, and inflation on railroad revenues. Table 150 shows the relationship of scrap tonnage and revenue to all carload tonnage and revenue over the period considered. Columns 6 and 7 of this table demonstrate that while scrap accounted for 0.55 percent of tonnage and 0.57 percent of revenue for southern territory carriers in 1958, it accounted for 0.94 percent of the tonnage and only 0.82 percent of the revenue in 1972. Scrap's revenue contribution when compared to tonnage seems to have decreased steadily over this period.

TABLE 150

Relationship of scrap iron and steel originated freight and revenue to all carload revenue freight traffic southern district[1] (1958-1972)

Year	Net tons originated		Revenue		Percentage scrap iron and steel of all freight traffic	
	All freight traffic	Scrap iron & steel traffic	All freight traffic	Scrap iron & steel traffic	Tons originated	Revenue
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1958	237,606,706	1,316,942	$1,190,783,399	$6,742,725	0.55	0.57
1959	251,179,081	1,792,003	1,235,488,778	8,844,984	0.71	0.72
1960	249,691,603	1,707,032	1,184,367,149	8,164,094	0.68	0.69
1961	247,460,416	1,925,185	1,179,497,247	9,132,732	0.78	0.77
1962	259,104,109	1,506,650	1,243,827,052	7,508,915	0.58	0.60
1963	271,768,237	1,764,331	1,280,333,160	7,743,930	0.65	0.60
1964	285,530,558	2,055,213	1,341,115,422	8,690,575	0.72	0.65
1965	297,228,786	2,095,277	1,400,859,569	9,147,926	0.70	0.65
1966	313,250,740	2,075,362	1,485,696,894	9,086,369	0.66	0.61
1967	328,671,100	2,210,672	1,517,158,101	9,140,251	0.67	0.60
1968	330,057,275	2,378,694	1,630,227,631	10,289,677	0.72	0.63
1969	340,584,027	2,816,445	1,785,412,784	12,069,392	0.86	0.67
1970	351,016,590	3,173,320	1,936,281,093	15,307,950	0.90	0.79
1971	348,096,398	3,142,747	2,124,470,292	17,656,577	0.90	0.83
1972	367,392,904	3,457,399	2,279,028,446	18,790,389	0.94	0.82

[1] Formerly shown as Southern Region.

Source: ICC Freight Commodity Statistics.

Another way of expressing this change comes from a comparison of figures 33 and 34. It is noted that while scrap iron tonnage increased approximately three times more than the increase on all other traffic, the revenue derived from scrap movements increased less than twice as fast as the increase on other traffic. In fact, average revenue per ton on scrap was only 6 percent higher in the southern territory during 1972 than it was in 1958, while average revenue per ton for all other traffic was 24 percent higher (see table 151 and figure 35).

FIGURE 33

Relationship Scrap Iron Tons Originated to All Other Traffic
Southern District Carriers
(1958 - 1972)

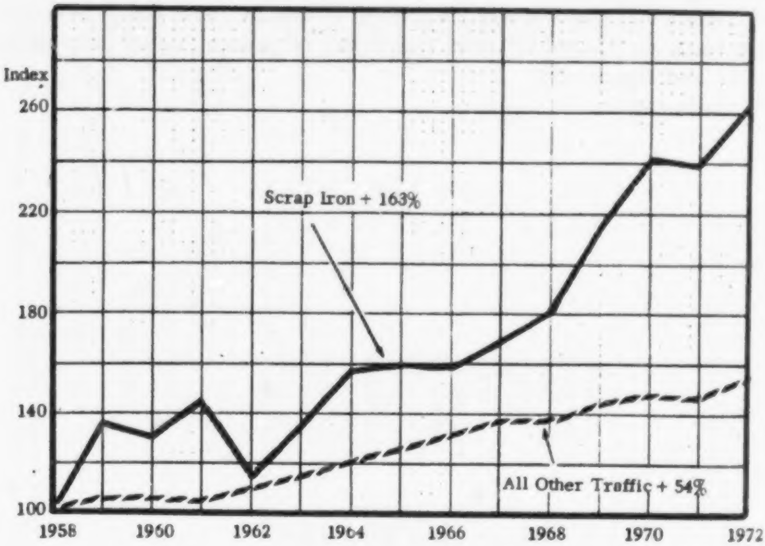
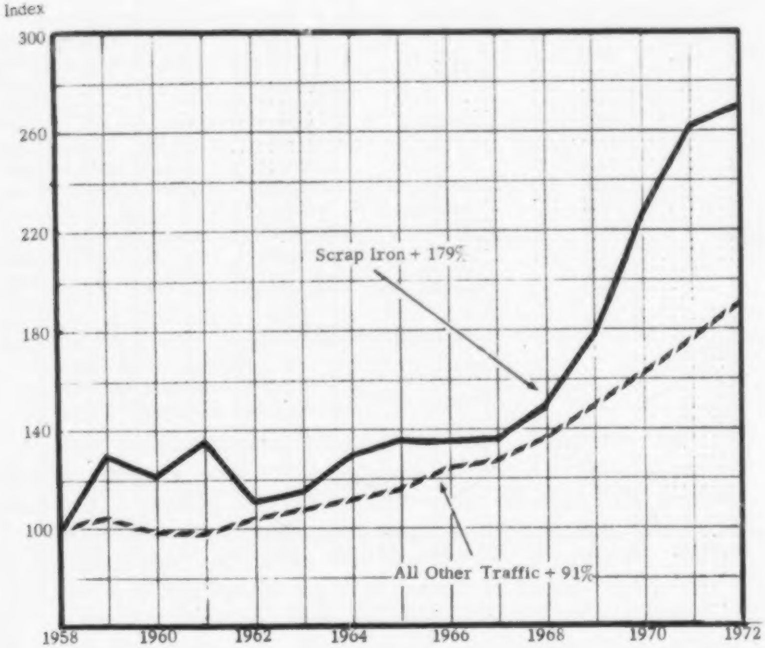


FIGURE 34

Relationship Scrap Iron Revenues to All Other Traffic
Southern District Carriers
(1958 - 1972)



345 I.C.C.

FIGURE 35

Revenue Per Ton
Southern District

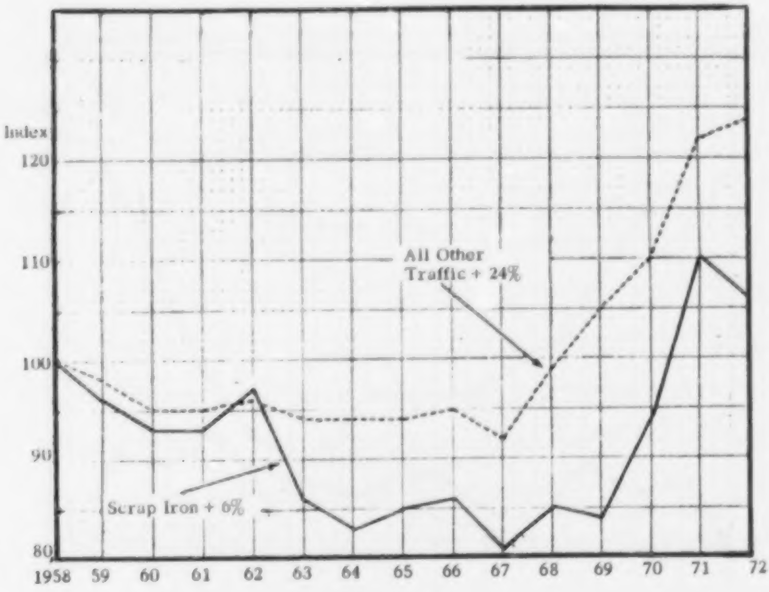


TABLE 151

Average revenue per ton on scrap iron and steel originated by Southern District[1] class I railroads

Year	Net tons originated	Revenue	Average revenue per ton	Index
1958	1,316,942	$6,742,725	$5.12	100
1959	1,792,003	8,844,984	4.94	96
1960	1,707,032	8,164,094	4.78	93
1961	1,925,185	9,132,732	4.74	93
1962	1,506,650	7,508,915	4.98	97
1963	1,764,331	7,743,930	4.39	86
1964	2,055,213	8,690,575	4.23	83
1965	2,095,277	9,147,926	4.37	85
1966	2,075,362	9,086,369	4.38	86
1967	2,210,672	9,140,251	4.13	81
1968	2,378,694	10,289,677	4.33	85
1969	2,816,445	12,069,392	4.29	84
1970	3,173,320	15,307,950	4.82	94
1971	3,142,747	17,656,577	5.62	110
1972	3,457,399	18,790,389	5.43	106

[1] Formerly shown as Southern Region.

Source: ICC Freight Commodity Statistics.

Finally, comparisons of revenue per ton adjusted by the GNP deflator index in table 152 and figure 36 indicate that revenue per ton in 1972 equaled only 73 percent of the adjusted 1958 revenue. The value of comparisons such as these clearly depends on the assumptions that one makes. If it is assumed that revenue in 1958 provided earnings just barely high enough to provide a fair rate of return for the involved railroads, then it would appear that 1972 earnings were too low. However, if the revenue/cost analysis provided in earlier sections of this report is interpreted as showing that the involved carriers are earning a fair rate of return today on movements of scrap, then it would appear that the higher earnings in 1958 may have been "more than fair." We are of the opinion that the historical analysis presented, standing alone, is not sufficient grounds for a finding that revenues per ton on scrap in the South have fallen below acceptable levels.

TABLE 152

Average revenue per ton on scrap iron and steel originated by southern district class I railroads in constant dollars
(1958-1972)

Year	Average revenue per ton	GNP deflator index (1958=100)	Adjusted index (1972=100)	Restated average revenue per ton	Index (1958=100)
1958	$5.12	100.0	146.1	$7.48	100
1959	4.94	101.6	143.8	7.10	95
1960	4.78	103.3	141.4	6.76	90
1961	4.74	104.6	139.7	6.62	89
1962	4.98	105.8	138.1	6.87	92
1963	4.39	107.2	136.3	5.98	80
1964	4.23	108.8	134.3	5.68	76
1965	4.37	110.9	131.7	5.76	77
1966	4.38	113.9	128.3	5.62	75
1967	4.13	117.6	124.2	5.13	69
1968	4.33	122.3	119.5	5.17	69
1969	4.29	128.2	114.0	4.89	65
1970	4.82	135.2	108.1	5.21	70
1971	5.62	141.6	103.2	5.80	78
1972	5.43	146.1	100.0	5.43	73

FIGURE 36

Revenue Per Ton on Scrap Iron in Constant Dollars

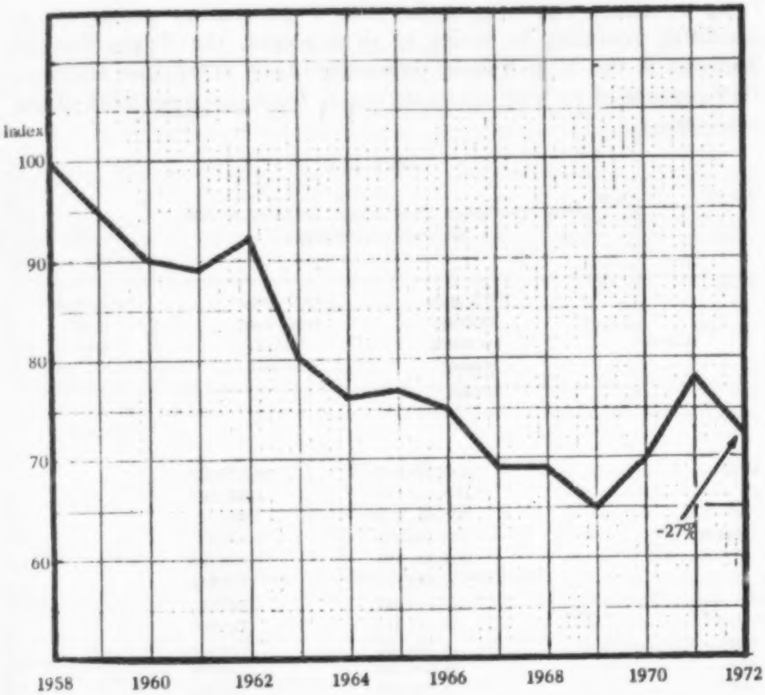


Table 153, presented by the western railroads, compares the 1973 gross revenues from the movement of scrap iron with the gross railway operating revenue for several railroads in western territory. It should be noted that, of the 26 railroads considered, only 12 had scrap revenues equalling more than 1 percent of gross railway operating revenue. In terms of percentages, the Texas-Mexican Railroad is the most heavily dependent upon scrap iron traffic as 10.9 percent of its total revenues comes from the movement of this commodity.

TABLE 153

Scrap iron versus gross railway operating revenue for western railroads

Carrier	1973 gross railway operating revenue	1973 gross scrap iron freight revenue	Scrap iron is of total
			Percent
ATSF	$947,743,067	$6,632,433	.7
BN	1,093,603,187	6,901,601	.6
CNW	416,681,378	7,392,439	1.8
CMSTPP	355,390,276	5,710,217	1.6
CRIP	329,001,796	2,258,141	.7
C&S	31,469,122	358,864	1.1
DRGW	118,873,865	1,703,045	1.4
DMIR	59,674,211	215,950	.4
DWP	14,789,101	119,658	.8
FWD	36,849,166	270,498	.7
GBW	8,778,603	50,742	.6
KCS	120,953,571	2,367,257	2.0
LSI	6,341,196	27,227	.4
MKT	90,042,280	1,489,584	1.7
MP	532,035,365	4,160,970	.8
NWP	12,792,340	15,140	.1
OE	6,745,898	144,557	2.1
SLSF	254,969,232	1,199,167	.5
SLSW	163,404,616	621,652	.4
SOO	168,324,179	2,082,507	1.2
SP	1,192,913,903	11,517,490	1.0
TM	8,009,858	874,469	10.9
TPW	12,620,675	455,924	3.6
T&P	128,684,770	831,640	.6
UP	870,920,901	2,745,508	.3
WP	89,578,217	1,017,222	1.1

Tables 154 through 177 and figures 37 and 38 are presented to show operating revenue data for individual railroads. This data is reproduced from information provided by the parties.

TABLE 154

Scrap iron & steel
STCC 40211

RAILROAD: THE ATCHISON, TOPEKA AND SANTA FE

	1973	1972
Carloads	26,501	19,146
Tons	1,334,738	976,489
Freight revenue	$6,632,433	$5,229,208
Average revenue:		
Per ton	$4.97	$5.36
Per ton mile (cents)	NA	NA
Per car	$250.00	$273.00
Average:		
Per car (tons)	50.37	51.00
Ton haul (miles)	NA	NA

TABLE 155

Scrap iron & steel
STCC 40211

RAILROAD: BURLINGTON NORTHERN INC.

	1973	1972
Carloads	22,412	17,963
Tons	1,127,364	928,733
Freight revenue	$6,901,601	$5,371,395
Average revenue:		
Per ton	$5.47	$5.16
Per ton mile (cents)	2.057	1.986
Per car	$307.94	$229.03
Average:		
Per car (tons)	63.1	64.8
Ton haul (miles)	237.2	232.2

TABLE 156

Scrap iron & steel STCC 40211

RAILROAD: CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC

	1973	1972
Carloads	20,120	17,240
Tons	1,069,074	920,189
Freight revenue	$5,710,217	$4,321,134
Average revenue:		
Per ton	$5.34	$4.70
Per ton mile (cents)	2.17	2.24
Per car	$283.81	$250.65
Average:		
Per car (tons)	53.1	53.4
Ton haul (miles)	245.6	209.4

TABLE 157

Scrap iron & steel STCC 40211

RAILROAD: CHICAGO AND NORTH WESTERN TRANSPORTATION COMPANY

	1973	1972
Carloads	34,176	30,643
Tons	1,775,036	1,642,727
Freight revenue	7,479,750	6,053,818
Average revenue:		
Per ton	$4.21	$3.68
Per ton mile (cents)	2.62	2.72
Per car	$218.86	$197.56
Average:		
Per car (tons)	52.0	53.6
Ton haul (miles)	161	135

TABLE 158

Scrap iron & steel STCC 40211

RAILROAD: CHICAGO, ROCK ISLAND AND PACIFIC

	1973	1972
Carloads	7,782	6,277
Tons	432,960	358,736
Freight revenue	$2,258,147	$1,856,606
Average revenue:		
Per ton	$5.22	$5.18
Per ton mile (cents)	2.10	2.09
Per car	$290	$296
Average:		
Per car (tons)	55.64	57.15
Ton haul (miles)	247	247

TABLE 159

Scrap iron & steel STCC 40211

RAILROAD: DENVER & RIO GRANDE WESTERN

	1973	1972
Carloads	1,003	680
Tons	53,215	32,058
Freight revenue	$570,970.96	$202,626.44
Average revenue:		
Per ton	$10.73	$6.32
Per ton mile (cents)	2.36	2
Per car	$569.26	$297.98
Average:		
Per car (tons)	53.06	47.14
Ton haul (miles)	454	289.5

TABLE 160

Scrap iron & steel STCC 40211

RAILROAD: DULUTH, MISSABLE & IRON RANGE RR

	1973	1972
Carloads	3,858	4,185
Tons (2240 pounds)	197,975	212,128
Freight revenue	$215,950	$298,332
Average revenue:		
Per ton	$1.09	$1.41
Per ton mile (cents)	8.73	9.58
Per car	$55.97	$71.29
Average:		
Per car (Tons 2240 pounds)	51.32	50.69
Ton haul (miles)	12.49	14.68

TABLE 161

Scrap iron & steel STCC 40211

RAILROAD: ELGIN, JOLIET & EASTERN RAILWAY CO.

	1973	1972
Carloads	29,780	25,527
Tons	1,503,066 G.T.	1,270,998 G.T.
Freight revenue	$4,489,138	$3,736,276
Average revenue:		
Per ton	$2.99/G.T.	$2.94/G.T.
Per ton mile (cents)	7.7/G.T.M.	7.5/G.T.M.
Per car	$151	$146
Average:		
Per car (tons)	50	50
Ton haul (miles)	38.7	39.3

TABLE 162

Statement indicating movements of scrap iron (STCC 40211) transported by the ICG (former IC and GM&O) during the years 1967-1973
(Tons per 2,000 pounds)

Year	Road	Local		Forwarded		Received		Overhead		Totals		Total revenue	Average revenue per car	Average tons per car
		Cars	Tons	Cars	Tons	Cars	Tons	Cars	Tons	Cars	Tons			
1967-----------	IC---------	3,801	196,599	3,808	198,424	1,679	90,422	515	5,511	9,803	490,956	$1,682,460	$171.63	50.08
1967-----------	GM&O-------	1,241	64,337	426	21,257	1,654	87,839	148	7,226	3,469	180,659	513,436	148.00	52.08
1967-----------	Total-----	5,042	260,936	4,234	219,681	3,333	178,261	663	12,737	13,272	671,615	2,195,896	165.45	50.60
1968-----------	IC---------	4,799	258,926	4,156	214,053	2,037	115,577	556	34,637	11,548	623,198	2,183,978	189.12	53.97
1968-----------	GM&O-------	1,106	54,161	633	31,266	1,551	84,801	74	3,592	3,364	173,820	524,146	155.81	51.67
1968-----------	Total-----	5,905	313,087	4,789	245,319	3,588	200,378	630	38,229	14,912	797,018	2,708,124	181.61	53.45
1969-----------	IC---------	4,333	227,471	5,153	273,061	1,983	113,907	548	33,391	12,017	647,830	2,318,732	192.95	53.91
1969-----------	GM&O-------	1,131	54,862	972	50,451	1,594	90,171	77	4,476	3,774	199,960	626,088	165.90	52.98
1969-----------	Total-----	5,464	282,333	6,125	323,512	3,577	204,078	625	37,867	15,791	847,790	2,944,820	186.49	53.69
1970-----------	IC---------	5,492	288,248	6,698	343,448	2,307	129,093	968	61,997	15,465	822,786	3,163,481	204.56	53.20
1970-----------	GM&O-------	1,305	63,929	1,068	58,515	2,867	158,384	295	15,179	5,535	296,007	965,646	174.46	53.48
1970-----------	Total-----	6,797	352,177	7,766	401,963	5,174	287,477	1,263	77,176	21,000	1,118,793	4,128,945	196.62	53.28
1971-----------	IC---------	4,151	225,378	6,301	334,821	2,282	134,134	1,240	78,899	14,474	773,232	3,264,800	225.56	53.42
1971-----------	GM&O-------	1,757	88,498	1,210	66,359	3,054	168,382	244	14,255	6,265	337,494	1,330,559	212.38	53.87
1971-----------	Total-----	5,908	313,876	8,011	401,180	5,336	302,516	1,484	93,154	20,739	1,110,726	4,595,359	221.58	53.56
1972-----------	IC---------	4,499	245,175	7,696	389,450	3,327	206,488	702	42,025	16,224	883,138	3,671,155	226.28	54.43
1972-----------	GM&O-------	2,065	109,839	1,217	70,104	2,692	146,244	199	9,582	6,173	335,769	1,320,418	213.90	54.39
1972-----------	Total-----	6,564	355,014	8,913	459,554	6,019	352,732	901	51,607	22,397	1,218,907	4,991,573	222.87	54.42
1973-----------	ICG--------	8,894	438,636	6,518	338,650	4,093	238,094	952	54,641	20,457	1,070,021	4,744,867	231.94	52.31
1973-----------	Total-----	8,894	438,636	6,518	338,650	4,093	238,094	952	54,641	20,457	1,070,021	4,744,867	231.94	52.31

SOURCE: QCS Report kept in the normal course of business.

TABLE 163

Scrap iron & steel
STCC 40211

RAILROAD: ILLINOIS TERMINAL R. R. CO.

	1973	1972
Carloads	8,223	6,979
Tons	470,050	391.945
Freight revenue	$1,045,493.00	$911,558.00
Average revenue:		
Per ton	$2.22	$2.33
Per ton mile (cents)	N/A	N/A
Per car	$127.14	$130.61
Average:		
Per car (tons)	57.16	56.16
Ton haul (miles)	N/A	N/A

TABLE 164

Scrap iron & steel
STCC 40211

RAILROAD: LAKE SUPERIOR & ISHPEMING

	1973	1972
Carloads	150	58
Tons (gross)	9,095	3,356
Freight revenue	$23,687.00	$7,288.00
Average revenue:		
Per ton	$2.60	$2.17
Per ton mile (cents)	65.1	54.3
Per car	$157.91	$125.65
Average:		
Per car (tons)	60.63	57.86
Ton haul (miles)	4.0	4.0

TABLE 165

Statement showing movements of scrap iron and steel via the Louisville and Nashville Railroad, systemwide, for the years 1967 through 1973, as reported in the quarterly commodity statistics filed with the Interstate Commerce Commission.

Year	Revenue freight originating on respondent road				Revenue freight received from connecting carriers				Total revenue freight carried		Average tons per car from total figures	Freight revenue dollars	Average revenue per car from total figures
	Terminating on line		Delivered to connections		Terminating on line		Delivered to connections		No. of carloads	No. of tons			
	No. of carloads	No. of tons	No. of carloads	No. of tons	No. of carloads	No. of tons	No. of carloads	No. of tons					
1967------	6,837	370,282	3,331	181,917	3,336	174,354	420	19,045	13,924	745,598	53.5	$2,320,206	$167
1968------	8,283	457,179	3,554	198,166	3,860	194,961	385	17,277	16,082	867,583	53.9	2,873,549	179
1969------	10,353	548,720	4,506	243,969	4,450	239,079	388	17,759	19,697	1,049,527	53.3	3,580,667	182
1970------	10,37[illegible]	528,622	5,094	266,959	4,770	260,860	330	16,905	20,568	1,073,346	52.2	4,005,142	195
1971------	11,67[illegible]	652,586	3,974	223,354	6,593	380,171	424	18,200	22,665	1,274,311	56.2	5,314,236	234
1972------	12,053	671,441	4,471	252,535	5,753	334,341	647	25,160	22,924	1,283,477	56.0	5,380,279	235
1973------	12,617	713,604	6,302	341,883	5,385	307,334	857	37,223	25,161	1,400,044	55.6	6,078,632	242

TABLE 166

Scrap iron & steel
STCC 40211

RAILROAD: MISSOURI-KANSAS-TEXAS R.R.

	1973	1972
Carloads	5,928	4,573
Tons	340,249	269,630
Freight revenue	$1,489,584	$1,174,983
Average revenue:		
Per ton	$4.378	$4.358
Per ton mile (cents)	--------------	--------------
Per car	$251	$257
Average:		
Per car (tons)	57.40	58.96
Ton haul (miles)	--------------	--------------

TABLE 167

Scrap iron & steel
STCC 40211

RAILROAD: MISSOURI PACIFIC RAILROAD COMPANY

	1973	1972
Carloads	14,399	11,379
Tons	805,428	637,888
Freight revenue	$3,889,244.00	$2,943,138.00
Average revenue:		
Per ton	$4.83	$4.61
Per ton mile (cents)	1.66	1.77
Per car	$270.11	$258.65
Average:		
Per car (tons)	55.9	56.0
Ton haul (miles)	291.20	261.39

best copy available

TABLE 168

Freight commodity statistics (Q.C.S.)-carload movements-scrap iron & steel (STCC: 40211)
St. Louis-San Francisco Railway Company

Year	Local cars	Local tons	Forwarded cars	Forwarded tons	Received cars	Received tons	Intermediate cars	Intermediate tons	Total cars	Total tons	Total revenue	Average revenue per car	Average tons per car
967------	723	38,674	1,723	87,707	174	8,275	378	21,746	2,998	156,402	$ 551,285	$183.88	52
968------	908	47,623	1,765	93,127	163	8,480	216	10,969	3,052	160,199	618,304	202.59	52
969------	1,062	55,240	2,028	108,534	242	12,053	236	10,552	3,568	186,379	711,872	199.52	52
970------	931	49,280	2,475	127,291	365	17,174	229	12,360	4,000	206,105	815,793	203.95	52
971------	1,094	56,202	2,334	114,739	338	18,123	260	13,642	4,026	202,706	1,025,540	254.73	50
972------	1,031	53,925	2,009	102,475	238	13,379	172	8,269	3,450	178,048	884,622	256.41	52
973------	855	46,468	3,774	200,355	460	23,628	307	16,720	5,396	287,171	1,199,167	222.23	53

TABLE 169

Scrap iron & steel
STCC 40211

RAILROAD: ST. LOUIS-SAN FRANCISCO RAILWAY COMPANY

	1973	1972
Carloads	5,396	3,450
Tons	256,403	158,971
Freight revenue	$1,199,167	$884,622
Average revenue:		
Per ton	$4.68	$5.56
Per ton mile (cents)	1.95	1.93
Per car	$222.23	$256.41
Average:		
Per car (tons)	48	46
Ton haul (miles)	216	257

TABLE 170

Statement showing the movement of scrap iron (STCC 40211) transported by the Seaboard Coast Line Railroad[1][2] *during the years 1967 through 1973*

Year	Originating SCL revenue freight				Interline received SCL revenue freight				Total revenue freight carried		Gross freight revenue dollars	Average	
	Local		Forwarded		Delivered		Forwarded		Cars	Tonnage		Tons per car	Revenue per car
	Cars	Tons	Cars	Tons	Cars	Tons	Cars	Tons					
1967	5,992	293,870	2,628	132,253	2,994	157,368	790	42,518	12,404	626,009	$1,640,417	50.47	132.25
1968	4,707	232,789	2,840	144,670	2,375	128,263	856	48,319	10,778	554,041	1,554,484	51.40	144.23
1969	7,274	361,406	2,309	118,050	3,464	188,269	690	34,703	13,737	702,428	2,039,273	51.13	148.45
1970	9,412	466,693	1,953	99,592	4,399	234,395	470	26,453	16,234	827,133	2,702,413	50.95	166.47
1971	8,472	420,320	1,917	98,063	3,859	211,991	514	27,282	14,762	757,656	2,815,490	51.32	190.73
1972	9,886	495,209	2,059	103,694	3,538	193,483	624	32,094	16,107	824,480	3,135,812	51.19	194.69
1973	11,596	556,952	2,004	96,847	5,066	274,046	564	28,045	19,230	955,890	3,817,982	49.71	198.54

---

[1] Includes movements of both the Atlantic Coast Line Railroad and Seaboard Air Line Railroad for the period January 1, 1967, through June 30, 1967.

[2] Includes movements of both the Seaboard Coast Line Railroad and Piedmont and Northern Railway for the period January 1, 1967 through June 30, 1969.

Source: Interstate Commerce Commission Report of Freight Commodity Statistics.

TABLE 171

Relationship of scrap iron and steel originated and total traffic and revenues to all carload freight traffic Southern Railway System

Year	Net tons originated		Total revenue freight carried		Gross freight revenue		Percentage scrap iron and steel of all freight traffic		
	All freight traffic	Scrap iron & steel traffic	All freight traffic	Scrap iron & steel traffic	All freight traffic	Scrap iron & steel traffic	Tons originated	Total tons	Revenue
1959	42,194,222	424,869	113,565,009	729,023	334,393,391	2,345,911	1.01	.64	.70
1973	95,943,186	1,405,593	149,397,013	1,711,020	754,449,838	6,760,360	1.47	1.15	.90
Increase	53,749,864	980,724	35,832,004	982,597	420,056,447	4,414,449	.46	.51	.20
Percentage Increase	127	231	32	135	126	188	46	80	29

Source: ICC Freight Commodity Statistics
ICC Quarterly Commodity Statistics

TABLE 172

Average revenue per ton scrap iron and steel originated by Southern Railway System
(1958-1973)

Year	Net tons originated	Revenue (dollars)	Average revenue per ton	Index
1958	424,869	2,345,911	$5.52	100
1959	521,951	2,846,573	5.45	99
1960	536,551	2,671,285	4.98	90
1961	598,756	2,914,649	4.87	88
1962	460,675	2,142,058	4.65	84
1963	568,204	2,356,713	4.15	75
1964	704,905	2,723,352	3.86	70
1965	757,757	3,033,506	4.00	72
1966	746,779	2,957,292	3.96	72
1967	755,511	2,832,935	3.75	68
1968	792,484	3,114,710	3.93	71
1969	916,760	3,439,487	3.75	68
1970	1,038,821	4,328,118	4.17	76
1971	1,082,834	4,953,903	4.57	83
1972	1,177,981	5,420,756	4.60	83
1973	1,405,593	6,760,360	4.81	87

Source: ICC Freight Commodity Statistics
ICC Quarterly Commodity Statistics

TABLE 173

Average revenue per ton scrap iron and steel handled by Southern Railway System

(1967-1973)

Year	Total tons	Gross revenue	Average revenue per ton	Index
1967	917,856	$2,832,935	$3.09	100
1968	980,868	3,114,710	3.18	103
1969	1,120,176	3,439,487	3.07	99
1970	1,241,858	4,328,118	3.49	113
1971	1,315,566	4,953,903	3.77	122
1972	1,437,774	5,420,756	3.77	122
1973	1,711,620	6,760,360	3.95	128

Source: ICC Quarterly Commodity Statistics

TABLE 174

Average revenue per ton all freight traffic other than scrap iron and steel handled by Southern Railway System

(1967-1973)

Year	Total tons	Gross revenue	Average revenue per ton	Index
1967	126,864,983	$441,402,683	$3.48	100
1968	132,124,755	492,284,524	3.73	107
1969	137,540,517	538,689,224	3.92	113
1970	138,481,760	574,049,998	4.15	119
1971	132,600,108	619,807,356	4.67	134
1972	146,521,998	697,775,133	4.76	137
1973	147,685,393	747,677,030	5.06	145

Source: ICC Quarterly Commodity Statistics

TABLE 175

Average revenue per ton scrap iron and steel handled by Southern Railway System in constant dollars

(1967-1973)

Year	Average revenue per ton	GNP deflator index (1958=100)	Adjusted index (1973=100)	Restated average revenue per ton	Index (1967=100)
1967	$3.09	117.6	130.9	$4.04	100
1968	3.18	122.3	125.8	4.00	99
1969	3.07	128.2	120.0	3.68	91
1970	3.49	135.2	113.8	3.97	98
1971	3.77	141.6	108.7	4.10	101
1972	3.77	146.1	105.3	3.97	98
1973	3.95	153.9	100.0	3.95	98

TABLE 176

Average per ton all freight traffic other than scrap iron and steel handled by Southern Railway System in constant dollars

(1967-1973)

Year	Average revenue per ton	GNP deflator index (1958=100)	Adjusted index (1973=100)	Restated average revenue per ton	Index (1967=100)
1967	$3.48	117.6	130.9	$4.56	100
1968	3.73	122.3	125.8	4.69	103
1969	3.92	128.2	120.0	4.70	103
1970	4.15	135.2	113.8	4.72	104
1971	4.67	141.6	108.7	5.08	111
1972	4.76	146.1	105.3	5.01	110
1973	5.06	153.9	100.0	5.06	111

TABLE 177

Scrap iron & steel
STCC 40211

RAILROAD: TEXAS AND PACIFIC RAILWAY COMPANY

	1973	1972
Carloads	6,481	5.501
Tons	348,940	291,766
Freight revenue	$796.327.00	$544,119.00
Average revenue:		
Per ton	$2.28	$1.86
Per ton mile (cents)	2.23	1.35
Per car	$122.87	$98.91
Average:		
Per car (tons)	53.8	53.0
Ton haul (miles)	102.58	137.81

FIGURE 37

Revenue Per Ton
Southern Railway

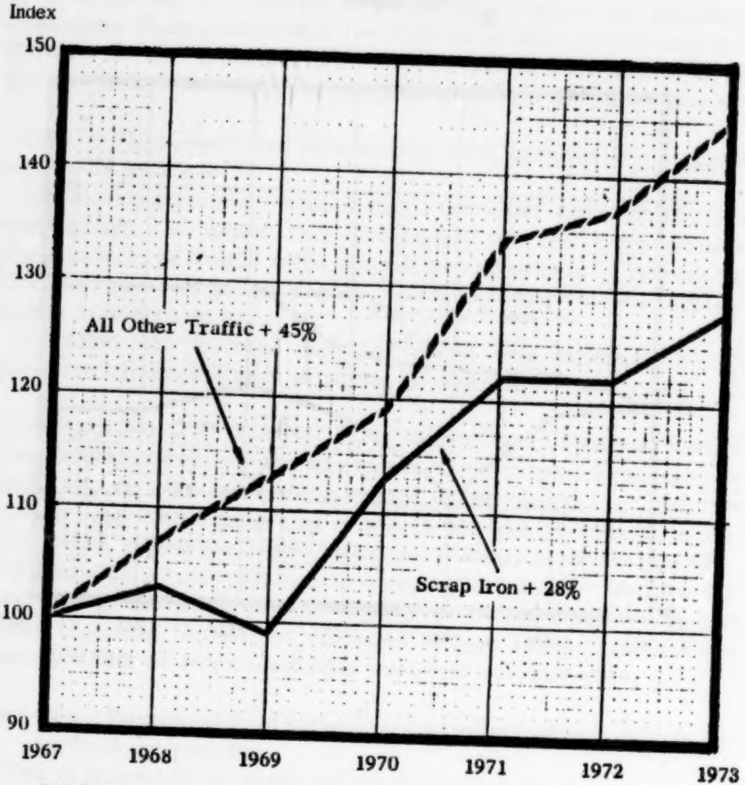
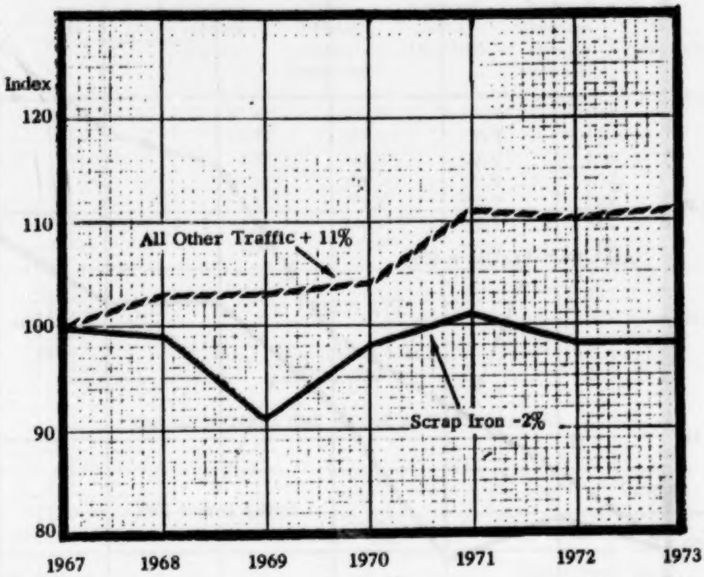


FIGURE 38

Revenue Per Ton
Southern Railway
In Constant Dollars



Part II: Intercommodity rate and revenue cost relationships between scrap iron & steel and iron ores.

For many years the issue of the relationship between iron ores and scrap iron and steel in the steelmaking process has been of major importance to parties in proceedings before the Interstate Commerce Commission and the Federal courts; cf. *Aberdeen & Rockfish R. Co.* v. *S.C.R.A.P.*, 422 U.S. 289 (1975). Insofar as the issue is relevant to this proceeding the questions of importance are:

(1) Does a competitive relationship exist between iron ore and scrap iron and steel?

(2) If a competitive relationship does exist between the two commodities, is either the relationship or the environmental consequences of freight rates of sufficient magnitude to require the Commission to establish a relationship between the two railroad freight rate structures?

(3) Does the current railroad freight rate structure unduly prejudice either shippers of scrap or shippers of iron ores?

Ex Parte No. 270 (Sub-No. 5), Investigation of Railroad Freight Rate Structure—Iron Ores, was specifically designed to examine in detail all available evidence in regard to the freight rate structure on iron ores. Data concerning iron ores that will be utilized in part II(B) of this report are derived from our findings in the Ex Parte No. 270 (Sub-No. 5) investigation as well as the data provided for this proceeding. Questions (1) and (2), *supra,* will be discussed in part II(A). Question (3) will be discussed in part II(B) as part of our consideration of intercommodity cost and revenue data.

Part II(A): Relationship of scrap iron and steel and iron ores in the steelmaking process.

The relationship of these two commodities in the steelmaking process has been frequently considered by the Commission in regard to the application of general freight rate increases as well as in individual complaint cases. Over the period of the last 15 years our knowledge and appreciation of the technical and environmental considerations involved in this issue have grown immeasurably. The record in this proceeding has aided considerably our attempt to understand more fully the competing points of view expressed by the parties.

This section will outline a summary of the previous cases that has dealt with this issue, summarize the evidence and arguments presented in this proceeding, and express the Coordinator's conclusions on the considered issues.

In *Institute of Scrap Iron & Steel, Inc.*, v. *Akron, C. & Y. R.*, 316 I.C.C. 55 (1962), the Commission noted that scrap and iron ore are major raw materials in the two separate processes by which steel is produced. While scrap encounters no important competition from iron ore, its use in steelmaking furnaces is, to some extent, alternative to the use of pig iron. It was concluded that there was no justification from a transportation standpoint for requiring a rigid relationship between the rates on scrap and the rates on iron ores.

Six years later the record in Ex Parte No. 256, *Increased Freight Rates, 1967,* 332 I.C.C. 280 (1968), led the Commission to the conclusion that low grades of iron ore were being concentrated and prepared so that they could be used in the blast furnaces in place of scrap or pig iron. On the basis of that conclusion, it was found that, notwithstanding the differences in the transportation characteristics of the two commodities, the increases on iron or steel scrap should be held to those permitted on iron ore in view of the competition between the two. The increases on the two commodities were allowed on a flat cents per ton basis.

The following year in Ex Parte No. 259, *Increased Freight Rates, 1968,* 332 I.C.C. 714 (1969), the findings on this issue, influenced in part by evidence introduced by producers of pig iron, were that iron and steel scrap compete directly with pig iron and that iron ore with an iron content in excess of 90 percent competes with both pig iron and scrap iron and steel. The Commission concluded that increases on pig iron and iron and steel scrap should not exceed the increases on iron ores. It permitted the application of a uniform increase of 5 percent, maximum 20 cents per ton to each commodity.

In Ex Parte No. 262, *Increased Freight Rates, 1969,* 337 I.C.C. 436 (1970), the Commission did not alter its statement of the competitive relationships found to exist in Ex Parte No. 259, *supra,* and concluded that 6-percent increases could properly be applied to scrap iron and iron ores. A scrap industry proposal that the increases on scrap be limited to the average cents per ton increase on iron ore was not adopted.

One year later the issue was considered again in Ex Parte No. 265 and Ex Parte No. 267, *Increased Freight Rates, 1970 and 1971,* 339 I.C.C. 125 (1971). In that case the Commission recognized the existence of four separate entities: scrap iron and steel, pig iron, iron pellets with an iron content in excess of 90 percent, and iron ore or iron ore pellets with an iron content of less than 73 percent.

While direct competition was found to exist between the first three, no direct competition was found between scrap and iron ore or iron ore pellets with an iron content of less than 73 percent. The increases approved on commodities generally, including iron ore and iron ore pellets, in Ex Parte No. 267 were 14 percent within the East, 6 percent within the South, and 12 percent within the West and interterritorially. It was concluded that because Ex Parte No. 267 was supported in part by the need of the railroads for the improvement of their net revenues some allowance should be made for environmental considerations. For this reason the maximum increases allowed on iron and steel scrap were 11 percent. Because of the competition shown with iron and steel scrap, the increases granted on pig iron and iron pellets were also held to an 11-percent maximum.

The following year in Ex Parte No. 281, *Increased Freight Rates and Charges, 1972,* 341 I.C.C. 290 (1972), the Commission again noted that the primary use of iron ore and iron ore pellets (both with an iron content of less than 73 percent) was in the manufacture of hot metal or pig iron (pig iron is cooled hot metal). The only commodities sufficiently pure in iron content to serve as direct inputs for steelmaking furnaces were found to be ferrous scrap, crude metallic iron or iron pellets, and pig iron or hot metal. The Commission affirmed the finding in Ex Parte No. 265 and Ex Parte No. 267 that ferrous scrap and iron ore do not specifically and directly compete to the extent that they require similar rate treatment. No justification was found for requiring that increases on ferrous scrap be made subject to the maximum per ton limitation applicable on iron ore because of the absence of direct competition and the existence of dissimilar transportation characteristics.

Since the closing of the record in this proceeding the Commission has had the opportunity to confront this issue in the most recent general freight rate increase cases. Although final determination of the issue was left to the instant proceeding, our comments in these cases are instructive for the increased sophistication developed in regard to an extremely technical issue.

In Ex Parte No. 295 (Sub-No. 1), *Increased Freight Rates and Charges, 1973,* 349 I.C.C. 250 (1974), the Commission dealt with a number of issues regarding scrap's relationship to iron ore and the effect of freight rates on the consumption of scrap. It found, *inter alia,* that the proposed increase would not discourage the use of scrap iron and steel and that increases approved in the past could not be shown to have detrimentally affected the demand for scrap.

The demand for scrap was found to be a function of the demand for steel. The Commission further noted that the differences in the freight rates on scrap and iron ore would not be called discriminatory in the absence of a discussion of the differing transportation characteristics of scrap and ore.

Of particular interest is the final discussion in regard to claims of discrimination made by scrap shippers:

> We must state here, in the strongest possible terms, that differences in rates alone, whether or not they offend a metallurgical equivalence formula, will not support a finding of discrimination under the Interstate Commerce Act. Discrimination must be measured by transportation standards and must be found unjust when that process is completed. The difference in rates cannot be held illegal unless we find that it is not justified by the cost of the respective services, by their values, or by other transportation conditions.

In deference to the seriousness of the issues raised and in light of the pendency of the instant proceeding, a holddown of 22 cents was imposed upon the increase approved for scrap. This 22 cents per gross ton holddown was equal to the holddown applicable on iron ore. This increase was designed to satisfy partially the respondents' demonstrated revenue needs and at the same time limit the effect of the increase on long-haul movements of ferrous scrap. It further was designed to remove any possible risk that the increase would retard movements of ferrous scrap.

In Ex Parte No. 303, *Increased Freight Rates and Charges, 1974, Nationwide,* 349 I.C.C. 862 (1975), a 4-percent increase was approved for both iron ores and scrap iron and steel after finding, *inter alia,* that the proposed rate increase would not materially impede the movement and consumption of scrap in relation to iron ores. Since economies other than transportation generally provide the principal constraints on recycling, increased freight rates were found to equate to fairly insignificant reductions in the total amount of recyclables entering the production process. It was found that: "To the extent the demand for scrap is essentially inelastic to transportation costs any decrease in scrap consumption in *direct* response to the increase will, as stated, be insignificant."

In Ex Parte No. 305, Nationwide Increase of Ten Percent in Freight Rates and Charges, 1974, the Commission allowed equal rate increases to be applied on iron ores and on scrap iron and steel, but no increase was allowed on scrap iron and steel moving for purposes of being recycled.

In Ex Parte No. 310, *Increased Freight Rates and Charges, 1975*, 349 I.C.C. 555 (1975), the Commission noted that the recycling industry was suffering greatly from the Nation's economic downturn. The price of heavy melting steel scrap declined from a peak market price of about $141 a ton during April of 1974 to around $77 a ton during December of 1974. As a result of this consideration, the increase allowed on iron and steel scrap in cents per ton was limited to the average increase on iron ores.

Finally, in Ex Parte No. 313, Increased Freight Rates and Charges—Labor Costs—1975, equal percentage increases were approved for application to both iron ores and scrap iron and steel.

Notwithstanding the extensive litigation already completed concerning the relationship of scrap and iron ore in the steelmaking process, this issue has been of primary importance in the instant proceeding. The railroads, steel manufacturers, and scrap shippers appear to be no closer to agreement than they were 15 years ago. Part I(B)(3) of this report presents a summary of current steelmaking processes as submitted by the parties. Much of this data is significant to the relationship issue and will be restated here for purposes of clarity.

The only facet of the discussion on which all parties are in agreement is that both scrap iron and steel and iron ores are used in the production of steel. The characterization of the use of these commodities as either competitive or complementary is the major source of disagreement. The railroads and steel companies view the relationship as complementary although a limited degree of competitiveness is acknowledged by some of these respondents. The scrap industry and EPA view the relationship as strictly competitive. It must be stated at the outset that each side has presented the testimony of "experts" and that these "experts" have argued their positions forcefully but have made no attempt to reach a common area of agreement. In many respects, the advocacy postures maintained by the parties have made this proceeding more difficult and more time consuming than would otherwise have been the case. Having stated this somewhat unpleasant fact, the remaining task is to review the evidence presented and to reach conclusions justified by the mass of conflicting evidence presented.

Run-of-mine ore and screened ore fines are used principally as feed for sintering plants which create an agglomerated iron-bearing material for blast furnaces. A small proportion of these two items is used directly in blast furnaces along with agglomerates and iron oxide pellets containing 62-64 percent iron to create hot metal or pig iron which contains 93-93 percent iron. A small portion of the iron oxide pellets is also used directly in open hearth furnaces as charge and feed ore or as coolant material.[18]

The parties maintaining that iron ore and scrap do not directly compete rely heavily on the fact that iron ore, as noted above, is used primarily to create hot metal or pig iron and is used only rarely in the three types of steelmaking plants, open hearth, basic oxygen and electric. The weight of iron ore used in steelmaking furnaces was approximately 1.4 percent of the weight of all materials used. Similarly, scrap is used only rarely in blast furnaces. In 1972 scrap used in this manner represented less than 4 percent by weight of the metallic feed to blast furnaces and one-third of the scrap so utilized was generated by the consuming furnaces.

The open hearth process, while still a significant factor in steelmaking, has declined in usage in the United States. In 1960 open hearth production accounted for 88.2 percent of steel output in the U.S., while in 1973 it accounted for only 26.4 percent. Six types of metallic charges can theoretically be employed in the basic open hearth process:

(a) All liquid blast furnace iron;
(b) Liquid blast furnace iron and liquid Bessemer-blown metal (Duplex process);
(c) Liquid blast furnace iron and solid iron and steel scrap;
(d) Liquid Bessemer-blown metal and solid iron and steel scrap;
(e) Solid blast furnace iron (pig iron) and steel scrap;
(f) All solid iron and steel scrap.

These six types of charges may not be used interchangeably. The type of charge used is governed or restricted by the suitability of the metallurgical practice to economic factors which vary with the geographical location of the plant with respect to location of sources of raw materials, with the availability of blast furnace metal, Bessemer-blown metal, and ferrous scrap, and with fluctuating market values of the materials, particularly scrap.

Two of the six types of charges theoretically possible, charges (b) and (d), are virtually never used in this country because of a lack of versatility and efficiency in the Bessemer process. Charges (e) and (f) are used only by open-hearth plants that do not have blast furnaces for the production of hot metal. (It should be clear that only the most unusual set of economic circumstances would make it profitable for a steel company to close down an existing blast furnace and utilize an all-solid charge.) Plants with blast furnaces may utilize charges (a) and (c) to create steel in the open hearth mills.

---

[18] Some special grades of iron ore can be used in direct reduction furnaces; however, the production of direct reduced iron in the United States in 1973 was less than 1 million net tons.

Again, the existence of the blast furnace and its capacity to provide hot metal or pig iron is the major determinant in the proportion of scrap that will be required in the steel mill. In almost all cases the steel company will attempt to utilize the blast furnace to capacity and will use scrap iron and steel in the open hearth process as a complementary material to the available hot metal and pig iron.

It appears from the record that, while a 100-percent hot metal charge (charge (a)) is theoretically possible, this charge is almost never used in the open hearth furnaces. Charge (c) which requires both hot metal and scrap is used in almost all open hearth furnaces. (The various types of scrap iron and steel may not be used interchangeably because of different chemical makeups and different melting characteristics. However, for the purposes of this report the use of all types of scrap iron and steel will be totalled under the general heading, scrap.) The most common charges in the open hearth furnace are between 40 and 65 percent liquid blast furnace metal and 35 to 60 percent scrap. The average charge for all open hearth mills between 1965 and 1972 included 41.1 percent to 45.6 percent scrap. While the "most common charge" appears to allow for significant interchangeability and thus direct competition between scrap and the product of iron ore, this appearance is misleading. Many factors unrelated to the total delivered price of either scrap or iron ore will determine the percentage usage of scrap or hot metal in the open hearth furnace. Included among these factors are the demand for total output from the mill, the capacity of the blast furnace supplying the hot metal, and the chemical composition and physical properties of the materials used. Charges using higher proportions of liquid metal generally result in faster furnace cycle time and higher productivity. After all these factors are taken into consideration, the delivered price of scrap appears to have only a very small effect on the percentage of scrap used in the open hearth furnace.

Unlike the open hearth process, the BOF process is not so versatile in its use of various proportions of liquid blast furnace metal and ferrous scrap. Notwithstanding this loss in versatility, BOF production increased from 3.4 percent to 55.2 percent of total United States steel production between 1960 and 1973. In most shops computers are used to calculate the proportions of scrap and liquid blast furnace metal needed to obtain a "thermally-balanced charge" for each heat. The delivered prices of iron ore and scrap are not part of the computer's calculations. The percentage of hot metal used in the BOF can theoretically range between 50 and 90 but normally the thermally-balanced charge ranges from 68-74 percent liquid blast furnace metal, depending on its chemical composition and temperature and on the extent to which pig iron is used with the scrap charge. Figures for all BOF furnaces indicate that the average scrap charge in the BOF is 27.8-30.1 percent. Hot metal usage as low as 63 to 67 percent has been maintained when the scrap is preheated or calcium or silicon carbide is added to the charge. These methods, while increasing the percentage of scrap that can be used, generally increase costs or decrease productivity.[19]

As the actual use of scrap in the BOF is normally within one or two percentage points of the maximum theoretical usage in the absence of preheating, it is difficult to maintain that scrap usage is disfavored by the steel companies or disadvantaged by the freight rate structure. While a 1-percent difference in scrap usage in the BOF involves as much as 833,000 tons and is clearly significant, the small variations in scrap and hot metal usage appear to be a function of the varying chemical characteristics of the commodities. No evidence has been presented that would directly link a relative increase or decrease in scrap usage in the BOF to freight rates. It must be concluded that the delivered price of scrap has not had the effect of reducing scrap inputs to the BOF process.

The electric furnace process is the most scrap intensive of all steelmaking processes. Average annual scrap consumption for all United States electric furnaces is 96.8 to 99.7 percent of all metallic input. Most electric furnace installations in the steel industry use a charge consisting of only ferrous scrap, although there are a few which use various proportions of scrap with pig iron and one specially designed plant using liquid blast furnace metal in the charge. The electric furnace using hot metal accounted for less than 1 percent of United States raw steel production in 1973 and is unique in that it was built to consume the output of an existing blast furnace. Scrap is not competitive with iron ore at this facility because the use of scrap would necessitate idling the blast furnace.

There are also three electric furnaces in Texas, Oregon, and South Carolina, consuming direct reduction iron pellets. The combined annual capacities of the three direct reduction facilities, located adjacent to the electric furnaces consuming their outputs, are about 1 million tons of prereduced pellets. While prereduced pellets are competitive with scrap iron and steel, the extent of this competition is not great and in the foreseeable future will not be significant. The reasons for this are that there is only one domestic source of iron ore that is suitable for direct reduction and the process consumes 12,000 to 14,000 cubic feet of natural gas per ton of reduced product. The current and projected shortage of natural gas will limit or make impossible the growth of direct reduction.

---

[19] In theory, preheated scrap can total 50 percent of the BOF charge but there is no evidence that this has been done in actual practice.

Electric furnaces are currently being built at the fastest rate of any type of steel mill, primarily because of their smaller size and more limited capital investment requirements. Production of steel in electric furnaces increased from 8.5 percent to 18.4 percent of total domestic output between 1960 and 1973. As they are so heavily dependent upon scrap, it would appear that the steel companies are not deterred by the price of scrap including rail delivery charges. This appearance is buttressed by the fact that, even when scrap prices were at record high levels and hot metal was cheaper to produce than scrap was to purchase, hot metal was not substituted for scrap in electric furnaces.

While real competition appears to exist between scrap and the limited amount of iron pellets with an iron content in excess of 90 percent, the relationship between iron ores and scrap iron and steel does not appear to be competitive in the short range. The capital investments in existing facilities, long-term contracts for iron ore, coal, and limestone, and the technological requirements of steelmaking appear to mandate operation of blast furnaces as close to capacity as possible, which will have the effect of reducing scrap consumption in years when the demand for steel is low. When demand for steel is high, as it has been in the recent past, the steel mills generally use the highest percentage of scrap possible in the steelmaking process because of the fixed size of blast furnace capacity.[20]

In the long range the situation also appears to be noncompetitive between the two commodities, at least in terms of known technology. Decisions as to what type of steel manufacturing plant to build depend on a variety of factors including local, State, and Federal tax laws, depletion allowances, iron ore holdings of the company making the decision, geographic markets for the finished products, types of markets involved as to the quality and category of steel to be produced, and prices and availability of raw material and other materials needed to make steel. In addition, the size of the mill to be built will generally dictate whether it will be an ore consuming BOF facility or an electric furnace facility consuming only scrap. Capacities in excess of 1.5 million annual tons of steel are needed to justify building a BOF plant. Since, as noted, these factors currently foster the development of scrap intensive electric furnace process mills, it is difficult to maintain that scrap iron and steel will be competitively disadvantaged in the long run.

---

[20] These high scrap demand years, resulting in historically high prices for scrap, have also pointed up the limited capacity of scrap producers to expand the available supply of scrap. There simply is not sufficient scrap available to replace iron ore in the steelmaking process even if this were technically possible.

The Coordinator accepts the fact that the use of scrap has greater environmental benefits to the United States than the use of iron ores. These benefits have been noted at length in the pleadings, other sections of this report, and in the Environmental Impact Statement prepared prior to the writing of the report. An accepted fact is that both iron ores and scrap iron and steel provide metallic inputs to the production of steel. However, the Coordinator must conclude, on the basis of the extensive record made in this proceeding, that the relationship between iron ores and scrap iron and steel is, in almost all cases, complementary and not competitive. The two commodities are both metallic inputs into the steelmaking process but they are not metallurgical substitutes.[21] Nor do they have similar transportation characteristics. (See part 1(c)(1).) The few instances of competition between these two commodities and the limited effect that rail freight rates would have on this short-term or long-term competition would not justify linking iron ore and scrap in a fixed freight rate relationship.[22] As a result, it is recommended that in future general freight rate increases, the application of any holddowns should be based on environmental or other data affirmatively demonstrating that the failure to apply such holddowns would have a significantly negative impact on the environment or on the movement of scrap rather than predicating such action solely upon the complimentary relationship between iorn ores and scrap iron and steel. Further, when it appears that terminal and line-haul expenses are shown to increase by similar percentages, to prevent increasing the relative burden borne by short mileage movements, further analysis and consideration should be given to the application of flat percentage increases.

---

[21] Among others, the rebuttal statement of Gerald R. Curtis for Armco Steel Corporation provided excellent examples of actual cases in which scrap would have been substituted for iron ore if it had been technically possible to do so. In each instance technical considerations made the substitution impossible. Other examples were shown of cases where production of steel by use of iron ore consuming facilities was not possible because of financial considerations and scrap consuming facilities had to be built. Freight rates played no part in any of these decisions.

[22] We have, however, recommended benchmarks against which individual freight rates on scrap iron may be judged to determine whether they are relatively unreasonalbe, see infra.

Part II(B): Revenue cost relationships

In part II(A) of this report, two of the primary questions raised in this investigation are discussed. The nature of the relationship between scrap iron and steel and iron ores in the steelmaking process has been considered and it has been determined that sufficient need has not been shown to establish a fixed relationship between the freight rate structures of scrap and iron ore.

This section will summarize the findings concerning the revenue/cost relationships of scrap and iron ore movements described in part I(D)(3) of this report for scrap and in part I(D)(3) of the Ex Parte No. 270 (Sub-No. 5) report for iron ore. The Coordinator will also answer question number 3 raised in part II, i.e., does the current railroad freight rate structure unduly prejudice either shippers of scrap or shippers of iron ores?

A oomparison of the intercommodity rate and variable cost relationship between scrap and iron ore for the representative movements is shown in table 178. This comparison is shown in terms of the simple average ratio of rates-to-variable costs by originating territories and by type of shipment together with the corresponding simple average actual miles moved. Also shown is a comparsion of the low and high ratios in each territory by type of shipment with the corresponding actual miles.

TABLE 178

Lowest, highest and simple average ratio of rate-to-variable cost by commodity, originating territory, type of shipment and corresponding actual miles

Originating territory	Scrap						Iron ore					
	Ratio range of rate to variable cost by type of shipment			Distance-actual miles by type of shipment[1]			Ratio range of rate to variable cost by type of shipment			Distance-actual miles by type of shipment[2]		
(1)	Single (2)	Multiple (3)	Trainload (4)	Single (5)	Multiple (6)	Trainload (7)	Single (8)	Multiple (9)	Trainload (10)	Single (11)	Multiple (12)	Trainload (13)
Official	*Percent*	*Percent*					*Percent*	*Percent*	*Percent*			
Lowest----------------------	57	108	---------	74	215	---------	90	103	114	645	138	368
Highest---------------------	351	271	---------	91	291	---------	140	230	334	260	45	45
Simple average of all movements----------------------	158	186	---------	171	232	---------	114	167	202	342	133	179
Southern												
Lowest----------------------	45	88	---------	11	343	---------	93	90	--------	302	1277	---------
Highest---------------------	240	234	---------	110	183	---------	132	178	--------	116	235	---------
Simple average of all movements----------------------	151	175	---------	221	282	---------	112	129	--------	235	358	---------
Western												
Lowest----------------------	71	119	---------	12	629	---------	38	83	65	1005	637	91
Highest---------------------	338	220	---------	182	341	---------	272	112	218	439	345	278
Simple average of all movements----------------------	154	184	---------	297	301	---------	79	94	129	159	477	235
Total simple average of all movements for all regions--	155	183	---------	228	256	---------	89	147	169	204	241	204

[1] Mileages shown in columns (5) and (6) are those associated with the movements for which ratios are shown in columns (2) and (3), respectively.

[2] Mileages shown in columns (11), (12), and (13) are those associated with the movements for which ratios are shown in columns (8), (9); and (10), respectively.

A breakdown of the corresponding simple average rate-to-fully allocated cost ratios between single-car scrap shipments and multiple-car and trainload iron ore shipments, originating in official territory, is shown in table 179.

TABLE 179

Simple average rate-to-fully allocated cost ratios on single-car scrap shipments and multiple-car and trainload iron ore shipments originating in the official territory

Method of distributing constant cost	Scrap single-car	Iron ore	
		Multiple-car	Trainload
	Percent	*Percent*	*Percent*
1. Ton and ton-mile	124	106	116
2. Car and car-mile	135	135	152
3. Dollar	125	131	160

Taking into account the cost revenue data that have been accepted from the verified statements and rebuttals thereto and the computations of representative movements submitted by respondent railroads and shippers, the Coordinator concludes that for comparable types of shipments for each originating territory the simple average ratios of rate-to-variable costs on scrap exceed those of iron ore in every instance. For example, the simple average ratio on scrap exceeds that for iron ore on single-car shipments by 44 percentage points in the official territory, by 39 percentage points in the southern territory, and by 75 percentage points in the western territory. The same situation also holds true with respect to multiple-car shipments. The simple average ratio on scrap exceeds iron ore by 19 percentage points in the official territory, by 46 percentage points in the southern territory, and by 90 percentage points in the western territory. As can be seen, the biggest disparity appears in the western territory where the simple average ratio of rate-to-variable costs for scrap is approximately double that shown for iron ore on both single- and multiple-car shipments.

A comparison cannot be made between scrap and iron ore for trainload shipments since there were no trainload scrap shipments reported. However, it is interesting to note that in the official territory the simple average rate-to-variable cost ratio for trainload shipments of iron ore was 202 percent. This is particularly significant in light of the fact that the preponderance of iron ore traffic moves as trainload shipments. Moreover, the largest segment of iron ore shipments occurs in the official territory.

A comparison of the corresponding simple average miles between scrap and iron ore by type of shipment in each territory reveals the following. For single-car shipments originating in the official territory, the miles are substantially greater on iron ore than they are for scrap (342 vs. 171). In the western territory origins the reverse is true, *e.g.*, the miles are greater on scrap than on iron ore for single-car shipments (297 vs. 159); whereas, in the southern territory origins the miles are approximately the same (221 vs. 235). For multiple-car shipments, the simple average miles are greater for iron ore shipments than for scrap in both the southern territory origins (358 vs. 282) and the western territory origins (477 vs. 301). However, the simple average miles are less for iron ore shipments versus scrap shipments originating in the official territory (133 vs. 232).

Another interesting observation can be made from looking at the low and high simple average rate-to-variable cost ratios and their corresponding miles. For single-car scrap shipments the lowest ratio for each territory is associated with rather low miles. However, the reverse is true with respect to iron ore where the lowest ratios for each territory have corresponding high mileage.

With respect to multiple-car shipments of scrap and iron ore originating in the southern and western territories the same pattern appears, namely that relatively low rate-to-variable cost ratios are associated with the high mileages while relatively higher rate-to-variable cost ratios are associated with lower mileages. No such comparison can be made for the official territory. Since there were no trainload movements of scrap, no comparisons were made for these shipments.

A comparison of scrap with iron ore by originating territory, type of movement and weight groups is shown in table 180 below. This comparison reveals that for comparable types of shipments within each of the specified weight groupings the ratio of rate-to-variable cost on scrap is higher than on iron ore in all instances but one, the multiple-car shipments in the official territory, 160,001-190,000-pound weight bracket.

TABLE 180

Simple average ratio of rate-to-variable cost by commodity, originating territory, type of shipment and by weight groups

Originating territory	Scrap			Iron ore		
	Type of shipment			Type of shipment		
	Single-car	Multiple-car	Trainload	Single-car	Multiple-car	Trainload
	(percent)	*(percent)*	*(percent)*	*(percent)*	*(percent)*	*(percent)*
Official weight groups:						
40,000-70,000	82	------	------	------	------	------
70,001-100,000	130	174	------	------	------	------
100,001-130,000	156	173	------	94	------	------
130,001-160,000	188	211	------	104	157	178
160,001-190,000	236	143	------	123	167	213
190,001-220,000	------	------	------	138	171	214
220,001-250,000	------	------	------	------	------	------
All weight groups	158	186	------	114	167	202
Southern weight groups:						
40,000-70,000	111	------	------	------	------	------
70,001-100,000	149	158	------	------	------	------
100,001-130,000	151	180	------	------	106	------
130,001-160,000	178	------	------	95	124	------
160,001-190,000	------	------	------	106	138	------
190,001-220,000	------	------	------	125	125	------
220,001-250,000	------	------	------	132	------	------
All weight groups	151	175	------	112	129	------
Western weight groups:						
40,000-70,000	146	------	------	------	------	------
70,001-100,000	138	------	------	70	------	------

Simple average ratio of rate-to-variable cost by commodity, originating territory, type of shipment and by weight groups—Con.

Originating territory	Scrap			Iron ore		
	Type of shipment			Type of shipment		
	Single-car	Multiple-car	Trainload	Single-car	Multiple-car	Trainload
	(percent)	*(percent)*	*(percent)*	*(percent)*	*(percent)*	*(percent)*
Western weight groups—Continued						
100,001-130,000	148	181	--------	72	93	113
130,001-160,000	185	207	--------	65	--------	104
160,001-190,000	227	--------	--------	109	--------	150
190,001-220,000	--------	--------	--------	211	96	158
220,001,250,000	--------	--------	--------	--------	--------	--------
All weight groups	154	184	--------	79	94	129

A comparison is also made in table 181 below by mileage blocks (50-mile increments from 0-50 to 501 miles and over) between scrap and iron ore for each originating territory. Generally, for both single-car and multiple-car shipments of scrap, as the miles increase the simple average ratio of rate-to-variable costs increases to certain levels and then tapers off. The highest ratios for scrap occurred in 25 to 300 and 301 to 350 mileage blocks.

TABLE 181

Simple average ratio of rate-to-variable cost by commodity, originating territory, mileage blocks, and type of shipment

Originating territory	Scrap (Sub-No. 6)			Iron ore (Sub-No. 5)		
	Type of shipment			Type of shipment		
	Single-car	Multiple-car	Trainload	Single-car	Multiple-car	Trainload
	(percent)	*(percent)*	*(percent)*	*(percent)*	*(percent)*	*(percent)*
Official mileage blocks:						
0-50	121	199	-------	127	227	334
51-100	142	174	-------	124	178	281
101-150	144	185	-------	-------	139	201
151-200	190	175	-------	-------	177	203
201-250	185	108	-------	98	-------	174
251-300	224	232	-------	140	-------	154
301-350	172	199	-------	-------	-------	129
351-400	205	198	-------	-------	-------	127
401-450	189	176	-------	111	157	-------
451-500	157	177	-------	116	138	-------
501 and over	149	131	-------	104	-------	-------
Southern mileage blocks:						
0-50	112	-------	-------	-------	-------	-------
51-100	167	-------	-------	-------	99	-------
101-150	158	202	-------	127	-------	-------
151-200	160	234	-------	128	-------	-------
201-250	176	169	-------	-------	165	-------
251-300	143	210	-------	100	136	-------
301-350	233	127	-------	103	132	-------
351-400	181	-------	-------	96	103	-------

Simple average ratio of rate-to-variable cost by commodity, originating territory, mileage blocks, and type of shipment—Continued

Originating territory	Scrap (Sub-No. 6)			Iron ore (Sub-No. 5)		
	Type of shipment			Type of shipment		
	Single-car	Multiple-car	Trainload	Single-car	Multiple-car	Trainload
	(percent)	*(percent)*	*(percent)*	*(percent)*	*(percent)*	*(percent)*
Southern mileage blocks:						
401-450	206	151	----	----	147	----
451-500	163	149	----	----	136	----
501 and over	163	141	----	----	90	----
Western mileage blocks:						
0-50	110	----	----	49	----	----
51-100	139	196	----	78	----	109
101-150	148	206	----	66	----	125
151-200	165	----	----	----	----	----
201-250	179	184	----	89	----	----
251-300	139	----	----	103	----	147
301-350	183	220	----	----	104	----
351-400	157	----	----	----	----	----
401-450	132	197	----	272	----	----
451-500	164	156	----	----	----	----
501 and over	168	119	----	151	84	104

It is difficult to make a similar comparison for iron ore since not all mileage blocks show ratios, i.e., no movements occurred in these mileage blocks. Nevertheless, it appears that as the miles increase on single-car shipments of iron ore the simple average ratios likewise increase and then at a certain level taper off. The same taper principle also appears to hold true with respect to iron ore multiple-car shipments in the southern and western territories and trainload shipments in western territory. However, a somewhat different picture is seen for multiple-car and trainload shipments of iron ore in the official territory. In this territory the simple average ratio decreases as the miles increase on both multiple-car and trainload shipments.

While this computation of the overall rate-to-variable cost ratios for all representative movements of scrap and iron ore shows the simple average rate-to-variable cost ratio on scrap to be 160 percent and the corresponding ratio on iron ore to be 135 percent, this comparison is of limited value and should not be the basis for a decision in this proceeding.

The representative movements give no consideration to the consist of the traffic, i.e., there is no weighting or volume factor available to properly weigh costs and revenues for the various single-car, multiple-car, and trainload shipments. A more meaningful comparison between scrap and iron ore may be made by comparing the rate-to-variable cost ratios for the predominant movements of these commodities.

Witness Abraham's examination of the 1972 waybill tape found that 92.5 percent of all scrap traffic moved as single-car shipments and the remaining 7.5 percent of the scrap traffic moved as multiple-car shipments. In comparison, only 7.7 percent of all iron ore traffic moved in single-car shipments and the remaining 92.3 percent of the iron ore traffic moved in multiple-car and trainload shipments. While the 1972 waybill study makes no distinction between multiple-car and trainload movements, it is generally recognized that the vast majority of all iron ore traffic is handled in trainload shipments. A comparison of rate-to-variable cost ratios between single-car scrap shipments and trainload iron ore shipments must be made in order to properly compare the overall revenue contribution of the two commodities.

This comparison shows that scrap has a rate-to-variable cost ratio of 158 percent on single-car shipments originating in the official territory versus a ratio of 202 percent on trainload movements of iron ore originating in the same territory. In western territory the opposite is true with single-car shipments of scrap having a rate-to-variable cost ratio of 154 percent versus 130 percent on trainload shipments of iron ore. No trainload shipments of iron ore were shown for the limited movements of iron ore in southern territory. Combining the official and western trainload shipments of iron ore and the official and western single-car scrap shipments shows that iron ore has the higher simple average rate-to-variable cost ratio of the two commodities. Trainload iron ore shipments have a simple average rate-to-variable cost ratio of 169 percent compared with 156 percent for single-car scrap shipments.

This breakdown of simple average rate-to-fully allocated cost ratios between single-car scrap shipments and multiple-car and trainload iron ore shipments originating in official territory (table 179) reveals that, under the ton and ton-mile method of allocating constant costs, single-car scrap shipments have higher simple average rate-to-fully allocated cost ratios than multiple-car and trainload shipments of iron ore (124 percent versus 106 and 116 percent). However, under the car and car-mile and dollar basis of allocating constant costs the reverse is true. Iron ore has the same or higher simple average rate-to-fully allocated cost ratios as does scrap.

As would be expected, the ton and ton-mile basis of allocating constant cost assigns a relatively larger portion of constant cost to the various movements of iron ores because of heavier loading per car and a greater total number of tons shipped. Thus, a disproportionate share of constant costs are allocated to iron ore shipments, and the car and car-mile and dollar basis of allocating constant costs presents a more reliable picture when a comparison is made between two commodities of different loading characteristics.

The revenue/cost comparisons made have established, to the Coordinator's satisfaction, that the predominant type of movement of scrap iron and steel does not contribute a greater share of the financial burden of the railroads than does the predominant type of movement of iron ores. The use of simple averages, while less precise than weighted averages, is adequate for this finding in light of the clear preponderance of single-car movements of scrap and trainload movements of iron ores.

The Coordinator rejects the notion that freight rates should be established on the basis of an equivalency formula between the iron contents of scrap and iron ore or the total costs of transporting the necessary raw materials to steel mills to create a ton of steel under various processes. Such a notion completely disregards the differences in transportation characteristics and costs of service between commodities.

A finding has been made in this proceeding that iron ore and scrap iron and steel are, for the most part, complementary and not competitive commodities in the steelmaking process. A further finding that sufficient reasons do not exist for the establishment of a fixed relationship in the freight rate structure between scrap and iron ore has also been made. The Coordinator has also found that the overall analysis made of the revenue/cost relationships on these two commodities does not establish any pattern of discrimination against scrap iron and steel and that for the most part freight rates on both iron ore and scrap are compensatory.

The findings and recommendations made in the "Disparities and Distortions" sections of the Ex Parte No. 270 (Sub-No. 5) report on iron ores and in this report on scrap iron and steel will be relied upon for recommendations to properly adjust the few instances of noncompensatory or unjustly high freight rates on the two commodities. These adjustments, if made, will also serve to narrow the gap between the burdens borne by individual movements of scrap and iron ores. In addition, once these adjustments have been made, future complaint cases and future general increase cases, if decided in the manner recommended herein, will preserve the rough equivalence found to exist in the burdens borne by the commodities and will also maintain the contribution figures at a level necessary to improve railroad service.

Part III Self-defeating nature of general increases on scrap iron and steel

The Coordinator's order to the parties of December 27, 1973, requested in part III of appendix A that the respondents show the general rate increases sought, those authorized by the Commission, and those actually applied by the carriers individually, or any other rate change on all significant movements of scrap iron and steel beginning with and subsequent to Ex Parte No. 256 increases. Reasons for the application of increases less than those authorized as well as other rate changes were to be set forth.

The parties were also requested to present evidence designed to show that general rate increases on scrap iron and steel may or may not have been self-defeating in nature with respect to generating revenues.

In part I of this report the material presented by the parties in regard to rate structures, general freight rate increases and individual rate adjustments has been set forth. It will be the purpose of this section to present the evidence submitted in regard to the potentially self-defeating nature of general freight rate increases and to evaluate this evidence.

With the exception of one unsubstantiated suggestion that general freight rate increases may have caused intermodal diversion of scrap traffic, the parties appear to be in agreement that the increases applied have not been self-defeating. Ex parte increases have been described by one of the parties as essential and as the best method for solving the problems caused by generally rising costs.

As authority for their conclusions on this issue, the parties have pointed out increased traffic volumes and revenue that have occurred concurrently with increased rates. Periodic declines in traffic and revenue are attributed to decreases in the demand for steel which in turn decreases the demand for iron and steel scrap.

The Coordinator agrees that general increases on iron and steel scrap have not been self-defeating in nature with respect to generating revenues. As noted in earlier sections, the demand for scrap which generates the requirement for rail transportation appears to be relatively price inelastic. While rail freight rates on scrap have been affected by the inflationary spiral this country has witnessed over the past few years, the demand for the services that the railroads provide scrap shippers and consumers has not declined. If the price of the commodity is combined with the freight rates charged by the railroads to determine the total cost to the consumer and this total cost is compared with demand for scrap in the last decade, no adverse effects can be found to have resulted from increased prices. In fact, if tables and graphs presented earlier are properly analyzed, it appears that the difficulty of expanding the supply of available scrap causes prices to rise during periods of increased demand. At the other end of the spectrum, reduced demand for scrap and for rail transportation of scrap seems to occur during periods of lower scrap prices. This is not to suggest that the demand for scrap is inelastic at all price levels, nor is it intended to suggest that the railroad freight rate structure should be designed solely to reflect the elasticity of any given commodity. The Coordinator finds that the general freight rate increases applied on scrap iron and steel have had no detrimental effects on the movement of scrap or on total railroad freight revenues from scrap.

Part IV: Disparities and distortions caused by general increases

The Coordinator's call for evidence by any party relating to rate changes, affected by general rate increases, for the movement of scrap iron and steel beginning with and subsequent to Ex Parte No. 256 increases which may have resulted in disparities or distortions between competing shippers and/or localities was virtually ignored by the parties.

A number of the respondents, most notably the railroads, took the position that there were either no disparities or distortions within the freight rate structure on scrap iron and steel or no disparities or distortions of any consequence.

One of the railroads was concerned with the regulatory time lag between approval of ex parte increases on interstate traffic and State commission approval of similar increases on intrastate traffic. This issue will be considered in part VII of this report, Matters Not Otherwise Listed.

In the absence of data provided by the parties in regard to this topic, the Coordinator has made an analysis of potential disparities and distortions within the scrap iron and steel freight rate structure. This analysis is based upon the data provided in part I of this report on 392 representative or repetitive movements of scrap in 1973.

Much of the data submitted in regard to the Coordinator's call for evidence regarding the intercommodity rate and revenue/cost relationships between scrap iron and steel and iron ore considered average revenue/cost calculations for the two commodities. While discussion of these calculations and the positions taken by the parties on this topic is found in parts I and II of this report, the concern is not just with the intercommodity relationships but also with intracommodity relationships. Discussion of the intracommodity relationships found to exist on movements of iron ores is in part III of Ex Parte No. 270 (Sub-No. 5). It will be the purpose of this section to present the results of this analysis of analogous information for the movements of scrap iron and steel.

In considering the potential existence of disparities and distortions in the freight rate structure of scrap iron and steel a few basic facts must be understood. First, the vast majority of all scrap traffic in each of the territories moves on point-to-point commodity rates. Thus it is not profitable to consider scale rate comparisons or classification comparisons between the territories. Second, the point-to-point commodity rates to be considered have been subjected to numerous changes in the past. In addition to single-car rates, numerous multiple-car rates have been published by the railroads. Rate relationships have been established between certain origination and destination points and these relationships have altered over the period of many years, either as the result of Commission action or action initiated by the railroads. Thus when the term freight rate structure is applied to the various rates on scrap iron and steel in the United States it is used in the loosest possible sense. There is currently no uniform formula or benchmark against which rates on scrap iron may be compared to test their reasonableness or to test for the existence of disparities and distortions caused by the approval and application of general freight rate increases.

The basis of any finding of disparities or distortions between competing shippers and/or localities must be that the freight rates paid by individual shippers differ significantly from the norm. In other words, if certain shippers are being favored by paying significantly lower rates than the normal rate or if other shippers are being disadvantaged by paying significantly higher rates than the normal rate then the condition of disparity or distortion can be said to exist.

This comparison of individual rates with an established norm is necessary because it is clear that the shippers and receivers of traffic moving under unusually high freight rates must absorb the higher prices to the detriment of their profits or market competitive situation. Second, the involved railroads will tend to use the increased profits from the traffic moving under high rates to offset lower profits on other traffic. If left unchecked, this tendency would lead to the sort of unjust discrimination that was one of the important reasons for the enactment of the Interstate Commerce Act and the creation of the Interstate Commerce Commission.

It is clear that not all disparities of this nature are in conflict with the provisions of the act. In the absence of other considerations, railroad management has complete freedom to adjust freight rates within the zone of reasonableness. However, rates that are noncompensatory are clearly outside the zone of reasonableness. Similarly, rates that are clearly excessive when compared to rates on similar commodities moving in similar transportation circumstances are also outside the zone of reasonableness.

The principle of relative reasonableness defined in *Chicago Board of Trade* v. *Illinois Central R. Co.*, 329 I.C.C. 529, 532 (1967) (reversed in part, 344 I.C.C. 818), is applicable here.[23] At the risk of oversimplification, the considerations involved in the term relative unreasonableness are these. Rates that are not "intrinsically unreasonable" under standards established by the Interstate Commerce Act and Commission decisions rendered thereunder may be found relatively unreasonable if, upon consideration of rates on like traffic in the same general territory, we are convinced that the rates cited by way of comparison are properly comparable and that, when given the weight to which they are entitled, they sufficiently indicate that the level of the rates attacked is too high. Of course, it must be clear that the rates compared with the rates under attack are not too low.

---

[23] This definition was accepted in *State Corp. Comm. of N. Mex.* v. *Southwestern Motor Frt.*, 329 I.C.C. 803, 807 (1967).

> Stated another way, a rate may be unreasonable in relation to another, or relatively, as a result of comparing the two. A rate likewise may be unreasonable in relation to cost, in relation to a prescribed basis of rates, or in relation to any other satisfactory standard which permits us to measure and determine the factual question presented. *Chicago Board of Trade, supra*, at 533.

A radical change in the freight rate structure on scrap iron and steel is not the goal of this proceeding. However, analysis of the revenue, cost, and other material provided in part I has made it possible to establish certain parameters for a freight rate structure that would leave unaffected the vast majority of individual rates while changing the limited number of rates found to be outside the bounds established. It is clear that any attempt to rationalize an existing freight rate structure must, at least to some extent, be arbitrary. Further, it is recognized that the data upon which these recommendations are based represent the facts in being in 1973 and not at the current time. Thus, these recommendations will be general in nature and will attempt to provide the formula or benchmark against which individual freight rates on scrap iron and steel may be measured in the future.

As it is not the Coordinator's intentions to prescribe scale rates or individual point-to-point commodity rates that will become quickly outmoded, the standards discussed will relate the rate structure to the single most important variable factor, cost of service. It seems beyond cavil that the movement of scrap iron and steel should be profitable for the involved railroads. None of the parties to this proceeding has proposed or suggested otherwise. However, analysis of the revenue/variable cost data developed in part I of this report indicates that some movements of scrap may currently be unprofitable; that is, revenue is less than 100 percent of variable cost.

Of the 392 representative or repetitive movements considered in part I of this proceeding, 40, or 10.2 percent of all movements, showed ratios of revenue to variable cost of less than 100 percent. The occurrence of these rates by territory and type of rate is shown in table 182. The occurrence by mileage is shown in table 183.

TABLE 182

Territory and type of low ratio movements of scrap iron and steel, 1973

	Single car	Multiple car	Total
Official	17	0	17
Southern	9	1	10
Western	13	0	13
Total	39	1	40

TABLE 183

Low ratio movements of scrap iron and steel by mileage, 1973

Mileage block	*Number of rates returning revenue below 100 percent of variable cost*
0-100	28
101-200	6
201-300	3
301-400	3

It should be noted that there may be some double counting involved in the 40 representative movements shown to have ratios below 100 percent. When two parties presented evidence concerning the same rate with slightly different raw data such as average loading per car, the calculations as to cost and revenue per ton were made and presented for both sets of data. It should also be noted that, while the 40 movements occurred in each of the three territories, ratios under 100 percent were almost exclusively found in the single-car rates and the vast majority of these low ratio movements were under 100 miles.

It is recommended that the involved carriers in each of the territories review the currently applicable rates and costs applicable to the single- and multiple-car movements shown in part I as returning less than 100 percent of variable costs. If current data indicate that these movements continue to be noncompensatory, upward revisions should be considered by the involved carriers.

A review of the revenue/cost analysis made in Ex Parte No. 270 (Sub-No. 4), *Investigation of Railroad Frt. Rate Structure—Coal,* 345 I.C.C. 71, 225-280 (1974), reveals that only nine of the considered representative or repetitive movements of coal returned revenues in excess of 230 percent of variable cost. Similarly, the revenue/cost analysis made in Ex Parte No. 270 (Sub-No. 5), Investigation of Railroad Freight Rate Structure-Iron Ores, revealed that only 16 of the 254 considered movements, or 6.3 percent, returned revenue in excess of 230 percent of variable cost.

It was the Coordinator's finding in the latter report that, based upon the evidence presented by the parties and the calculations of the costs involved in the considered movements, ratios of revenue to variable cost in excess of 230 percent present an anomaly when viewed against the norm for the transportation of iron ores.

In the instant proceeding, only 32 of the 392 considered representative or repetitive movements of scrap iron and steel, or 8.2 percent, returned revenue in excess of 230 percent of variable cost. Table 184 sets forth the occurrence of these movements by territory and type of rate and table 185 sets forth the occurrence by mileage blocks.

TABLE 184

Territory and type of high ratio movements of scrap iron and steel, 1973

	Single car	Multiple car	Total
Official	17	6	23
Southern	2	2	4
Western	5	0	5
total	24	8	32

TABLE 185

High ratio movements of scrap iron and steel by mileage, 1973 mileage block

	Number of rates returning revenue greater than 230 percent of variable cost
0-100	3
101-200	7
201-300	12
301-400	8
401 and up	2

The occurrence of 29 of the 32 high ratio movements in mileages greater than 100 is particularly significant in light of the finding in table 183 that 28 of the 40 low ratio movements occur in mileages less than 100. The potential for cross-subsidization mentioned previously appears to be realized in that some longer distance movements are providing the revenue needed to offset losses incurred from some of the movements under 100 miles.

The Coordinator finds, based on the evidence presented by the parties and calcultations of the costs involved in the transportation of scrap iron and steel, that ratios of revenue to variable cost in excess of 230 percent represent an anomaly when viewed against the norm for the transportation of scrap. It is, therefore, recommended that the parties involved with the 32 movements shown in part 1 to return revenues in excess of this percentage review the current rates and costs for these movements. Revisions downward should be considered in instances where the ratio continues to be in excess of 230 percent. In future complaint cases, a showing that movements of scrap iron and steel return revenues in excess of 230 percent of variable cost may raise a rebuttable presumption that the involved rates are unjustly and unreasonably high.

It is quite clear that the evidence presented has not shown a necessity for a major overhaul of the freight rate structure on scrap iron and steel. To the limited extent mentioned above it has shown a need for the recommended revisions in specific rates that appear to be noncompensatory or that appear to return revenue in excess of 230 percent of variable cost. The Coordinator's conclusion should not be interpreted as saying that all rates on scrap returning revenues equal to or less than 230 percent of variable cost will automatically be found to be just, reasonable, and otherwise lawful. Individual cases will be decided, as always, on the basis of the facts presented therein.

Part V: Uneven Effects of Increases on Individual Railroads

A major problem reflected in the statements is the meaning given to the term "uneven effects" by the various parties. In the Ex Parte No. 270 (Sub-No. 3) proceeding, Investigation of Railroad Freight Rate Structure—Uneven Effects of General Increases on Individual Railroads, many of the parties were of the opinion that uneven effects on commodities, shippers, and market areas would be handled most appropriately in the various commodity subnumbered proceedings, and that the Sub-No. 3 proceeding should be strictly related to uneven effects on individual railroads, i.e., the strong and weak railroad problems.

The uneven effects element was included in this investigation to provide the Commission with substantive evidence by any party designed to show the uneven revenue effects (if any) of general rate increases in freight rates on scrap iron and steel on individual railroads, why these results may have occurred, and what remedial action could be taken. The analysis following addresses the question of whether approval and application of the increases has advantaged or disadvantaged certain railroads, shippers and market areas.

For the purpose of this analysis the trend in tonnage carried and the revenues derived from the traffic for the period covered by the recent surge in general increases (1966-1973) have been used as indicators to measure the impact of the increases on the individual railroads. Data submitted in reference to these points have been included in part I(D)(7). Additional data, primarily involving the eastern railroads is found in tables 186 through 188 of this section. While differences have been noted between territories and between railroads, no evidence has been presented to indicate that these differences may be described as uneven effects caused by the application of general freight rate increases.

TABLE 186

Scrap iron and steel revenue per ton carried, 1966-1973
(Dollars)

Year	Major[1] eastern roads	Eastern[2] bankrupt roads	Eastern district	Southern district	Western district	Total United States
1966	$2.97	$3.05	$2.75	$2.89	$3.45	$2.94
1967	2.64	3.03	2.77	2.88	3.42	2.95
1968	3.26	3.21	2.98	2.98	3.51	3.11
1969	3.30	3.37	3.03	3.05	3.63	3.19
1970	3.58	3.64	3.31	3.37	3.99	3.51
1971	4.07	4.17	3.74	3.76	4.49	3.95
1972	4.23	4.34	3.85	3.76	4.57	4.04
1973	4.34	4.48	3.95	4.13	4.77	420
Percent change 1966-1973.	+46.13	+46.88	+43.64	+42.91	+38.26	+42.86

[1] B&O, B&LE, N&W, PC, Reading and EL.

[2] PC, EL and Reading.

TABLE 187

Iron and steel scrap (STCC 40211) railroad tonnages and revenue, 1966-1973 (B&O, B&LE, N&W, PC, Reading and EL)

Year	Gross tons (1)	Gross revenue (1)	Average revenue per ton (1)
1966	18,498,791	$54,974,391	$2.97
1967	17,041,431	44,962,371	2.64
1968	17,589,813	57,297,501	3.26
1969	18,953,715	62,604,897	3.30
1970	16,886,540	60,469,067	3.58
1971	16,358,571	66,555,419	4.07
1972	17,169,856	72,613,872	4.23
1973	20,281,754	87,925,737	4.34
Percent change 1966-1973:	+9.64	+59.94	+46.13

Percent to total U.S. scrap iron traffic

	Tons	*Revenue*
1966	47.3	47.8
1973	43.9	45.4

(1)Source: : Composite data of six Eastern railroads (B&O, B&LE, N&W, PC, Reading and EL).

TABLE 188

40211 iron and steel scrap, wastes and tailings
(Thousands)

Year	Penn Central			Reading			Erie Lackawanna			Lehigh Valley		
	Total tons carried	Gross revenue	Gross revenue per ton	Total tons carried	Gross revenue	Gross revenue per ton	Total tons carried	Gross revenue	Gross revenue per ton	Gross revenue carried	Total tons	Gross revenue per ton
1966[1]	11,080	$35,414	$3.20	1,281	$2,527	$2.01	890	$2,515	$2.82	295	$814	$2.76
1967[1]	10,391	32,981	3.17	1,386	2,813	2.03	786	2,256	2.87	180	525	2.92
1968[1]	11,241	37,834	3.37	1,249	2,567	2.06	725	2,100	2.90	203	589	2.90
1969	11,549	41,015	3.55	1,440	3,267	2.27	831	2,436	2.93	228	635	2.79
1970	10,381	39,530	3.81	1,374	3,484	2.54	797	2,825	3.54	215	679	3.16
1971	10,202	44,366	4.35	1,218	3,423	2.81	703	2,786	3.96	210	833	3.971
1972	10,314	47,252	4.58	1,204	3,524	2.93	802	3,039	3.79	304	964	3.17
1973	11,819	56,616	4.79	1,529	4,392	2.87	926	3,404	3.68	269	785	2.92
Percent change 1966-1973	+6.67	+59.87	+49.69	+19.36	+70.76	+42.79	+4.04	+35.19	+30.45	-8.81	-3.57	+5.80

[1] Includes New York Central, New York, New Haven & Hartford, and Pennsylvania Railroad.

Source: Individual *Freight Commodity Statistics.*

As noted previously, demand for scrap iron and steel is primarily dependent upon the demand for steel. Over the course of the years, considered demand for steel has fluctuated, old steel mills have been closed down, new steel mills have opened and new sources of scrap iron and steel have been developed. All of these factors have influenced the volume and location of demand for movements of scrap by rail. It is apparent that these factors and not the imposition of general freight rate increases are the cause of fluctuations in tonnage and revenue between territories and railroads.

While there have been a limited number of waivers of ex parte increases as noted previously, these waivers have generally resulted from intermodal competition. No instances of waivers by strong carriers to capture traffic from weaker carriers have been noted. The Coordinator concludes, therefore, that with reference to movements of scrap iron and steel, there have been no uneven revenue effects as a result of the application of approved general freight rate increases.

Part VI: Railroad Service

In part VI, appendix A, of the order of December 28, 1973, the Coordinator asked the parties to submit any evidence bearing on the issue of whether general increases have provided sufficient revenues to induce the railroads to undertake improvements in service to meet the requirements of shippers of scrap iron and steel; and whether the railroads, in requesting general increases in freight rates, have taken into account possible variations in services being provided to shippers of scrap.

At the time the Coordinator issued that order the Commission already had instituted a proceeding in Ex Parte No. 270 (Sub-No. 2) entitled "Investigation of Railroad Freight Service", now pending. It was not intended that part VI of the investigation in the instant proceeding into the freight rate structure on scrap iron and steel be duplicative of the more comprehensive service investigation in Ex Parte No. 270 (Sub-No. 2). It was the Coordinator's purpose to give shippers of scrap and other interested parties an opportunity in this proceeding to express their views in connection with freight service on scrap within the framework of the issues presented.

Scrap iron generally moves in gondola cars and has transportation characteristics that remove the traffic from the most profitable or most desirable categories. While the freight rates, when viewed against the cost of service, generally provide an adequate rate of return, the damage done to the freight cars by the scrap and the irregularity of the service requirements compare unfavorably with situations encountered with other commodities. Table 189 compares the loaded trips per car per year for gondolas and for hopper cars. It will be noted that gondolas average only 52 percent of the loaded trips averaged by hoppers.

TABLE 189

	Loaded trips per car per year	
	1972	1973
Gondolas—plain—under 61'	19.5	21.4
Hoppers—special service	37.6	40.9

Source: Association of American Railroads
Car Service Division
Washington, D.C. 20036
Annual Equipment Loading Report
CS54—1B
52 weeks ended December 29, 1973
52 weeks ended December 30, 1972.

Carriers must look to their freight earnings for the funds required to maintain an inventory of suitable cars and locomotives for moving scrap in addition to maintaining plant and facilities properly. The railroad respondents stress the fact that the present rate of return on all traffic, when viewed against the cost of capital, spiraling operating expenses and other factors bearing on the financial posture of the individual railroads, is inadequate and should reach at least 10 percent.

Generally, the railroad respondents consider service provided to shippers of scrap to be adequate. They maintain that efforts are being made to improve service and that general freight rate increases have assisted in providing the funds necessary to maintain and expand the existing fleet of cars. Individual railroads have stated that increases granted on scrap have not been sufficient to cover increased costs, that revenue contributions from the movement of scrap have declined, and that consequently little money has been available to purchase additional cars.

The adequacy of the number of cars currently available is a point of contention between the parties. While the railroads viewed the number of cars as adequate until 1973 and noted shortages after that date, the shippers feel that the shortages became serious as early as 1968. The railroads have theorized that less expenditures have been made on scrap cars as a result of diminishing revenue contributions and that such expenditures are more readily made for cars used to transport goods providing relatively higher revenue. The shippers feel that this theory constitutes a form of blackmail against their consistent protests of increased rates.

As all parties seem to be in agreement that car supply is currently inadequate, it seems worthwhile to note the scope of the problem. The draft environmental impact statement for this proceeding projected a minimum volume of scrap tonnage of 51.9 million net tons by 1985. This would be an increase of 55 percent above the 33.5 million net tons originated in 1973. Assuming an average loading of 56 net tons per car, 926,786 carloads of scrap will be originated by 1985, as opposed to 602,329 carloads in 1973.

The Southern has stated that the average scrap car in their system completes 27 cycles per year. Projecting this figure to all U.S. railroads and dividing the total carloads in 1973 and the total projected carloads for 1985 by 27, it would appear that 22,308 cars were used in 1973 to move scrap and that 34,325 cars will be required by 1985.

The Southern has also estimated that 42 percent of all existing scrap cars will have to be replaced by 1985 because of the Association of American Railroad's ruling that cars over 40 years old be retired by that date. Thus, in addition to the 12,017 new cars required, 9,369 replacement cars will also have to be purchased. As gondolas currently cost approximately $26,000, the total of 21,386 cars to be purchased by all U.S. railroads will require expenditures of $556,036,000 between now and 1985. This enormous expenditure must be justified by the earnings from the transportation of scrap.

The shippers do not appear to be as sanguine as the railroads about the current level of service. Beyond the car shortage problems, the shippers note delays in car delivery, dirty, broken, and wrong-size cars, constructive placement notices without actual placement of cars on the tracks, bunched deliveries of cars, insufficient cars to allow utilization of five-car minimum rates, illegible weight limits and tare weight descriptions, inoperative or faulty scales, and uncooperative railroad personnel.

The railroads in reply state the complaints registered against their service are derived from questionnaires sent to 1,200 shippers which generate only 233 replies. They view the complaints as indications of selective service problems and not as indications of a pervasive problem with the service provided to all shippers.

Suffice it to say that it is clear that not all shippers are currently pleased with the service provided. The problems noted are not unique to the movement of scrap, as they seem to appear sporadically in railroad service to all shippers. Because of this fact, it is not deemed advisable to make recommendations specifically in regard to the service provided to scrap shippers. The service problems noted in this proceeding will be considered in more depth in the Ex Parte No. 270 (Sub-No. 2) proceeding noted above.

The problems of car supply do appear to be directly related to the revenue contributions earned from the movement of scrap. As noted in part I of this report, earnings on a per-shipment basis would appear to be adequate for the vast majority of all shipments of scrap. However, these earnings do not appear to provide sufficient inducement to the railroads to make the investment necessary to provide an adequate number of scrap cars. This seeming contradiction would appear to stem from the relatively poor utilization of the cars on an annual basis.

While the car supply problem appears to be genuine, the capacity of the railroads to have moved significantly greater amounts of scrap in recent years than were moved previously indicates that the problem is a function of timing as opposed to absolute numbers. That is, while cars may not always be available on the date requested by shippers, they do become available after a short delay. The car supply problem may become more serious in the future if the necessary investment in gondolas is not made. Should these problems occur, a more sophisticated study should be made by the railroads to determine not just the revenue contribution on a per-shipment basis but also the revenue contribution per car on an annual basis to determine whether the freight rate structure actually provides the funds required to justify the expenditures for new cars.

The Coordinator finds that the freight rate structure on scrap iron and steel, as affected by general freight rate increases, currently provides sufficient revenues to induce the railroads to provide adequate if not optimum service to the shippers of scrap. The Coordinator further finds that increases as approved and as applied have properly taken into account the type and extent of service being provided to the shippers of scrap iron and steel. And the Coordinator further finds that general freight rate increases on scrap iron and steel in the future must provide the railroads with sufficient revenue to financially justify the large expenditures that will be needed to purchase additional cars for the movement of scrap.

Part VII: Matters Not Otherwise Listed.

In the event that the parties desired to raise issues germane to this proceeding that would not naturally fall within the ambit of parts I through VI, the Coordinator offered the opportunity to present evidence under Part VII, Matters Not Otherwise Listed. Such evidence was to indicate specifically the purpose for which it was being introduced and the reason it does not come within one of the six foregoing categories. Additionally, the principal focus of the investigation as set forth in the report of the Coordinator, 345 I.C.C. 1, and the relationship of scrap iron and steel with iron ores was to be kept in mind.

While some parties were notably lax in their interpretations of the Coordinator's instructions, two issues have been raised that should be briefly mentioned. As previously noted, two of the railroads in southern territory are concerned with the delays experienced in the approval of intrastate rate increases. Table 190 presents the timelag, in days, between the effective dates of interstate and intrastate increases from Ex Parte No. 256 through Ex Parte No. 295-A. These delays are considered significant for two reasons. First, they cause large revenue losses and, second, they create a time period in which intrastate shippers have a competitive advantage over interstate shippers.

TABLE 190

Statement showing the timelag, in days, between the effectiveness of Ex Parte increases on interstate and intrastate traffic in Southern States

Interstate or intra-state	X-256	X-259-A	X-259-B	X-262	X-265-A	X-265-B	X-267-A	X-267-B	X-281	X-281-B	X-295-A	Total
Interstate effective	Aug. 19, 1967	June 24, 1968	Nov. 28, 1968	Nov. 18, 1969	June 9, 1970	Nov. 20, 1970	Nov. 20, 1970	April 12, 1971	Feb. 5, 1972	Oct. 23, 1972	Aug. 19, 1973	
Intrastate:												
Alabama	37	---	202	280	---	215	---	340	---	265	62	1401
Florida	212	---	492	343	---	379	---	423	---	75	216	2,140
Georgia	52	174	286	287	---	367	---	497	253	161	135	2,212
Kentucky	121	38	44	253	---	50	---	466	251	136	194	1,653
Mississippi	54	---	1,366	1,179	---	1,055	---	902	---	160	135	4,851
North Carolina	37	247	284	794	---	917	---	764	---	137	229	3,409
South Carolina	44	191	399	317	---	395	---	374	---	221	211	2,152
Tennessee	72	---	172	278	---	195	---	566	---	---	*285	1,568
Virginia	110	126	242	321	---	161	---	244	---	122	162	1,488

*-Increase has not been authorized in Tennessee. Days have been computed through May 31, 1974.

Source: Ex Parte Increase Tariffs.

While some of the delays noted in the table are significant, the causes of such delays are not readily apparent. The record does not show the dates the intrastate increases were proposed nor does it show what steps, if any, the railroads may have taken to request expedited action on their requests for intrastate increases. In addition, the parties have not mentioned what actions they may have taken under section 13 of the Interstate Commerce Act to bring the delays to the Commission's attention. Section 13(4) authorizes the Commission to institute an investigation into intrastate rates whether or not theretofore considered by any State agency or authority and without regard to the pendency before any State agency or authority of any proceeding relating thereto. That section further requires the Commission to expedite the hearing and decision in such cases.

The Commission considered the issue of delays in the granting of intrastate increases in *Kansas Intrastate Freight Rates and Charges—1971*, 343 I.C.C. 400 (1973). As was stated at page 408 of that report,

> *** In Ex Parte No. 265 and Ex Parte No. 267, *Increased Freight Rates 1970 and 1971*, [339 I.C.C. 125] the Commission commented upon the adverse effect of delayed intrastate rate increases in the following manner: 'Approximately 14 percent of the respondents' gross revenues is derived from intrastate traffic. *** In nearly all cases, the increases on intrastate traffic do not take place for a period of several months after the interstate increases. Not infrequently, prolonged proceedings under section 13 of the Interstate Commerce Act are required to establish the intrastate increases. All of these delays and limitations have a significant impact on railroad revenues and working capital, particularly since increases are normally sought to meet cost increases already incurred.'
>
> It appears that carriers, while claiming an urgent need for additional revenue in general rate increase proceedings before this Commission, are at times unduly lax in seeking intrastate rate increases. Carriers, as indicated by this proceeding, have not diligently pursued the need to raise intrastate rates when such rates are so low as to cast an undue burden on interstate commerce.

Because of the limited evidence presented on this issue, the Coordinator is unable to make any finding in this proceeding as to whether the carriers have been diligent in their attempts to secure intrastate increases from the appropriate State regulatory agencies. As it seems clear that section 13(4) is an appropriate vehicle for the carriers to bring the need for individual intrastate increases to the Commission's attention, no recommendation is made in this area.

The second issue raised in this section involves the current levels of switching charges for scrap movements. The eastern railroads, Louisville and Nashville Railroad, and Southern have all expressed concern that currently applicable switching charges for domestic, export, interterminal, and intraterminal movements are below compensatory levels. This issue is of considerable moment in that at least one of the carriers suggested that switching movements account for fully 26 percent of all scrap tonnage handled in 1972 and that the deficits incurred on this traffic create a severe financial drain on the railroads. Unfortunately, the problem alleged to exist is beyond the scope of this proceeding. Insufficient data has been provided to make any analysis of the extent of the involved movements or the financial aspects of these movements. Appropriate provisions of the Interstate Commerce Act provide the railroads with the opportunity to file increases on these charges if indeed they are noncompensatory. Accordingly, no findings or recommendations are made as to this issue.

Part VIII: Final Environmental Impact Statement.

As explained in the Coordinator's notice to all parties of November 29, 1973, an independent fact finding study concerning scrap iron and steel and iron ores was instituted in order to develop a record sufficient to enable the Coordinator to make the environmental assessment required by the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§4321-47 (1970). The final environmental impact statement was completed in June 1974 and was served on all parties to this proceeding by order of the Coordinator on August 2, 1974.

The principal findings of the study, hereby adopted by the Coordinator, are that:

In the near term, the consumption of purchased scrap is inelastic to changes in the transportation rate charged; therefore, changes in the rate for scrap iron and steel have very little impact upon the consumption of scrap. A 10-percent increase in the rate for scrap iron and steel results in only a 0.6-percent decrease in the consumption of purchased scrap. Similar increases in consumption were experienced for decreases in the rate for scrap iron and steel.

The impact on the environment of these rate changes is similar, but of smaller magnitude than the impact on scrap consumption. A 10-percent increase in the rates results in an increase in all the environmental factors considered, but the increase, in general, is less than 0.3 percent. Table 191 shows, for the near term, the effect of changes in the rate structure on each residual considered in the study.

TABLE 191

Near term percentage changes in residuals for changes in the freight rates[1]

Residual	Rate change for ferrous scrap				
	+20	+10	0	-10	-20
	Percent	*Percent*	*Percent*	*Percent*	*Percent*
Energy	0.23	0.12	0	0.12	0.23
Particulates	0.33	0.16	0	0.17	0.34
Sulfur oxides	0.42	0.21	0	0.21	0.42
Carbon monoxide	0.20	0.10	0	0.10	0.20
Hydrocarbons	0.43	0.21	0	0.21	0.41
Nitrogen oxides	0.32	0.16	0	0.10	0.23
Ammonia (in air)	0.42	0.22	0	0.23	0.44
Ammonia (in water)	0.43	0.21	0	0.23	0.44
Cyanide (in water)	0.43	0.21	0	0.23	0.44
Phenols (in water)	0.43	0.21	0	0.23	0.45
Suspended solids	0.27	0.14	0	0.14	0.28
Slag	0.28	0.14	0	0.14	0.28

[1] Includes all phases of production affected—raw material extraction and processing, transportation, iron and steel production, scrap collection and processing, and scrap transportation.

Reductions in the rate charged for the transportation of scrap iron and steel will, in the near term, decrease the cost of scrap. However, in the long term, reductions may have an adverse effect upon the growth of electric furnaces associated with minimills.[24] Part of the economic incentive for establishing minimills has been the advantage derived because of their lower transportation costs, i.e., minimills are located near their source of scrap and their demand for their finished products. Rate reductions on scrap iron and steel will reduce this incentive and may slow down the growth rate of minimills. This, in turn, would decrease the demand for scrap.

In the long term, changes in the transportation rate have a negligible impact on the environment. Based upon projected demands for obsolete scrap in 1985, the supply will be insufficient to satisfy demand. Therefore, prices will be high and the shortage will be satisfied by (1) increasing the supply of obsolete scrap beyond the breakeven level projected, or (2) developing the capability of producing prereduced ore as a substitute for scrap. The reason for the projected shortage in scrap is due primarily to changes anticipated in the steel production processes, namely, continuous casting and its effect on the generation of home scrap,

---

[24] Minimills are small steel production facilities which do not use blast furnaces in their steel production process.

the growth in electric furnaces and their high scrap consumption potential, and potential increases in the percent of scrap charged in BOF's resulting from the implementation of scrap preheating facilities.

The benefits and costs of improving the environment through various proposed changes in the relative rate structure were also evaluated. The benefit/cost ratio when more than 90 percent of the environmental improvements is considered was found to be less than 0.1, i.e., the benefits received were less than one-tenth of the costs incurred when compared to alternatives available for improving environmental quality.

The costs of not increasing rates, although imposed directly on the railroads through losses in revenue (which the railroads deem necessary), will ultimately be passed on to the public because of:

(a) The need to provide additional revenue to the railroads by increasing freight rates on other commodities, or

(b) The need to use Government funds to subsidize railroads.

The benefits, which consist primarily of improvements in environmental quality, are received by the public. The steel industry would capture some of the benefits if a lessening of pollution from other sources somehow reduced the steel industry's need to incur the expenses of limiting its own pollution. However, under existing environmental regulations, pollution from the steel industry is measured and based upon peak levels of operation. Thus, decreases in pollution due to increased scrap usage will not change the pollution resulting from operations of the plants unless peak levels of operation are reduced through the higher level of scrap consumption. Since a reduction in levels of operation is unlikely, the steel industry should not capture significant environmental benefits.

Alternatives to the use of rail freight rates as a means of increasing scrap consumption and, therefore, improving the environment were also suggested in the final EIS. These were directed primarily at economic incentives to ensure that future growth and equipment replacement within the steel industry is directed toward "high" scrap consumption technology. In addition to creating the appropriate economic atmosphere, two other related suggestions were made:

(a) Formalize the scrap market operations to stablize prices and ensure a more reliable source of scrap, and

(b) Improve the quality of obsolete scrap through the use of improve processing techniques.

Part IX. Ultimate Findings and Recommendations

The Coordinator finds:

1. That because the demand for scrap is inelastic to changes in the transportation rate charged, fluctuations in the freight rate for scrap iron and steel will have very little impact on scrap consumption in the near term. Maintaining or lowering current rates will either not improve the railroads' financial position or will result in a loss of revenues by the railroads with only minimal improvements in environmental quality. In the long term, demand for obsolete scrap will exceed available supply due to anticipated changes in steel production processes by 1985. Changes in transportation rates within the zone of reasonableness will have negligible impact on the environment.

2. That the delivered price of the higher value commodity, scrap iron and steel, is significantly less dependent on rail freight rates than is the delivered price of iron ores.

3. That the predominant movement of iron ores in trainload quantities makes a higher revenue contribution to the railroads than does the predominantly single-car movement of scrap iron and steel, and that the freight rate structure of these commodities does not discriminate against the movement of scrap.

4. That the relationship between scrap iron and steel and iron ores in the steelmaking process is, in almost all cases, complementary and not, for transportation purposes, significantly competitive.

5. That the few instances of competition between scrap and iron ore and the limited effect that rail freight rates would have on this competition or on the environment would not justify linking iron ore and scrap in a fixed freight rate relationship.

6. That the transportation characteristics of scrap iron and steel do not compare favorably with the transportation characteristics of iron ores, and that on a per-ton basis services provided on scrap movements are considerably more costly to the railroads than are the services provided on movements of iron ores.

7. That the overall freight rate structure on scrap iron and steel is compensatory and not unreasonably high, but that some individual rates are noncompensatory and others are abnormally high.

8. That the railroads should examine current costs and revenues on movements of scrap iron and steel shown to be noncompensatory at the September 1, 1973, rate and cost levels to determine the need for increases on the rates for these movements.

9. That the respondents should examine current costs and revenues on movements shown to have a rate/variable cost relationship in excess of 230 percent at the September 1, 1973, rate

and cost levels, and that in future complaint cases a showing that movements of scrap iron and steel return revenues in excess of 230 percent of variable cost may raise a rebuttable presumption that the involved rates are unjustly and unreasonably high.

10. That, in future general rate increase proceedings on scrap iron and steel, if any holddowns are applied, they should be based on environmental or other data affirmatively demonstrating that the failure to apply such holddowns would have a signficant negative impact on the environment or on the movement of scrap, and that the complementary relationship between iron ores and scrap iron and steel, does not, standing alone, warrant the application of holddowns, in all instances.

11. That future general rate increases on scrap iron and steel should preferably be made on flat percentage bases when terminal and line-haul expenses increase by similar percentages to prevent increasing the relative burden borne by short-mileage movements.

12. That the impact of general freight rate increases applied to the transportation of scrap iron and steel had not been self-defeating and has been necessary in generating additional revenue to pay for increased labor costs and higher prices of materials and supplies.

13. That the application of general increases authorized by the Commission has not caused any substantial distortions in the freight rate structure, but that some distortions in the freight rate structure exist which have evolved apart from general freight increases and which, in some instances, have been amplified by such general increases.

14. That the impact of general freight increases on scrap iron and steel has not been shown on this record to have had an uneven effect in meeting the revenue requirements of individual railroads.

15. That the general freight increases sought by the railroads and authorized by the Commission have, for the most part, been for the purpose of offsetting higher prices of materials and supplies and increased wage costs, and that while railroad service on scrap iron and steel movements is currently adequate in most cases, close scrutiny regarding the financial contribution made by movements of scrap will be necessary to prevent any possible adverse effect on the capacity of the railroads to provide adequate service.

It is ordered, That this subnumbered proceeding be, and it is hereby, closed.

Index of tables, figures, and maps

Table No.	Table name	Page No.
1.	Grades of scrap iron and steel--	875
2.	Consumption of home scrap in steel production	876
3.	Supply of iron and steel scrap available for U.S. consumption and export	881
4.	Controlled air emissions and energy consumption for collection and processing of obsolete scrap	897
5.	Raw steel production and consumption of pig iron and scrap in U.S. steelmaking furnaces	900
6.	Consumption cf iron ore and scrap in steel production	900
7.	Pig iron production and the consumption of scrap in U.S. blast furnaces	901
8.	Iron and steel foundry shipments	904
9.	Scrap and pig iron usage by type of furnace	905
10.	Raw steel production by State--	905
11.	Shipments of iron and steel castings, and production of steel ingots by geographic areas: 1972 and 1971	907
12.	Production of pig iron and consumption of iron and steel scrap and pig iron, by geographic areas: 1972 and 1971	910
13.	Location of steel mills in the United States	915
14.	Raw material consumption and scrap production per net ton of pig iron produced	919
15.	Typical raw material consumption per ton of pig iron production in the near term	920

Table No.	Table name	Page No.
16.	1985 raw material consumption per net ton of pig iron based upon current technology using only agglomerates	922
17.	1985 raw material consumption per net ton of pig iron based upon a charge of all prereduced ore	922
18.	Estimate of raw steel production by type of furnace, 1985	923
19.	Raw steel production by the various melting processes	924
20.	Raw material consumption per net ton of raw steel produced in the BOF	925
21.	Proportion of scrap and hot metal used in the BOF	925
22.	Typical raw material consumption per net ton of raw steel produced in the BOF in the near term	927
23.	1985 production function for 1 ton of raw steel production in BOF based upon current technology	927
24.	Production function for 1 net ton of raw steel production in a BOF with scrap preheating	928
25.	Production function for 1 net ton of raw steel produced in a Q-BOP	929
26.	Raw material consumption per net ton of raw steel produced in the open hearth	930
27.	Proportion of scrap and hot metal used in the open hearth	931
28.	Typical raw material consumption per net ton of raw steel production in the open hearth in the near term	931
29.	Raw material consumption per net ton of raw steel produced in electric furnances	933

Table No.	Table name	Page No.
30.	Proportion of scrap and pig iron used in the electric furnace	934
31.	Typical raw material consumption per net ton of raw steel production in an electric arc furnace in the near term	934
32.	Best contemporary electric furnace practice, 1970	936
33.	Raw material consumption per net ton of raw steel produced in the electric furnace in 1985	936
34.	Raw material consumption per net ton of raw steel production in an electric furnace using various levels of prereduced materials	938
35.	Product yield--------------------	939
36.	Percentage of scrap and pig iron	941
37.	Consumption of selected raw materials per net ton of steel castings shipments	941
38.	Scrap generated in producing steel castings	942
39.	Estimate of percentage of steel castings produced, by furnace	942
40.	Typical raw material consumption per net ton of steel castings shipment in the near term	943
41.	Percentage of scrap and pig iron input in iron foundry furnaces	944
42.	Consumption of selected raw materials per net ton of iron castings shipments	944
43.	Scrap generated in producing iron castings	945
44.	Estimate of percentage of iron castings produced, by furnace	945
45.	Typical raw material consumption per net ton of iron castings shipment in the near term	946

Table No.	Table name	Page No.
46.	Uncontrolled air emissions for steel and foundry production activities	959
47.	Uncontrolled water pollutants from and energy requirements for steel and foundry production activities	960
48.	Air emissions and energy consumption for transportation modes	960
49.	Transportation required to move raw and recyclable materials	961
50.	Summary of uncontrolled loadings and near term and long term controls	962
51.	Long term controls on transporta- emissions	964
52.	Comparison of environmental impacts for the production of carbon steel using virgin and/or recycled materials	965
53.	Comparison and environmental impacts for the production of carbon steel using virgin and/or recycled materials	966
54.	Iron and steel scrap, origins-------	968
55.	Iron and steel scrap, destinations--	968
56.	Origon States of representative rates	979
57.	Destination States of representative rates	980
58.	Movements originating within official territory	981
59.	Movements originating within western territory	982
60.	Movements originating within southern territory	984
61.	Statement of originated tons, gross freight revenue and average revenue per ton on iron ore and scrap iron and steel handled by rail in the United States.	986

Table No.	Table name	Page No.
62.	Comparison of the ratio of average rail transportation charge to delivered price on scrap iron and steel with iron ore	988
63.	Iron and steel scrap—comparison of railroad tonnages and revenue with steel production, scrap consumption and prices, 1966-1973	990
64.	Comparison of 1975 scrap prices with 1975 scrap freight rates	991
65.	Rate changes for scrap iron and steel	992
66.	Rate changes for scrap iron and steel in official territory	994
67.	History of ex parte increases on scrap iron from, to, and within SFA territory	996
68.	Statement showing scrap iron rates, minimum weight 50,000 pounds, applicable within SFA territory, in effect since 1932 to present	1000
69.	Statement showing scrap iron rates, minimum weight 80,000 pounds, applicable within SFA territory, in effect since 1932 to present	1003
70.	Statements showing scrap iron rates in 5-car lots, minimum weight 500,000 pounds, applicable within SFA territory, in effect since 1962 to present	1005
71.	History of ex parte increases on scrap iron from, to and within southwestern territory	1010
72.	IFA scrap iron scale---------------	1011
73.	WTL scrap I/S scale---------------	1012
74.	History of ex parte increases applying on scrap iron/steel in WTL territory	1013

Table No.	Table name	Page No.
75.	Earnings, rates and costs for single-car movements originating in official territory, actual weight group: 40,001 to 70,000 pounds	1017
76.	Earnings, rates and costs for single-car movements originating in official territory, actual weight group: 70,001 to 100,000 pounds	1017
77.	Earnings, rates and costs for single-car movements originating in official territory, actual weight group: 100,001 to 130,000 pounds	1017
78.	Earnings, rates and costs for single-car movements originating in official territory, actual weight group: 130,001 to 160,000 pounds	1019
79.	Earnings, rates and costs for single-car movements originating in official territory, actual weight group: 160,001 to 190,000 pounds	1019
80.	Earnings, rates and costs for multiple-car movements originating in official territory, actual weight group: 70,001 to 100,000	1019
81.	Earnings, rates and costs for multiple-car movements originating in official territory, actual weight group: 100,001 to 130,000 pounds	1020
82.	Earnings, rates and costs for multiple-car movements originating in official territory, actual weight group: 130,001 to 160,000 pounds	1020
83.	Earnings, rates and costs for multiple-car movements originating in official territory, actual weight group: 160,001 to 190,000 pounds	1020

Table No.	Table name	Page No.
84.	Earnings, rates and costs for single-car movements originating in southern territory, actual weight group: 40,001 to 70,000 pounds	1021
85.	Earnings, rates and costs for single-car movements originating in southern territory, actual weight group: 70,001 to 100,000 pounds	1021
86.	Earnings, rates and costs for single-car movements originating in southern territory, actual weight group: 100,001 to 130,000 pounds	1021
87.	Earnings, rates and costs for single-car movements originating in southern territory, actual weight group: 130,001 to 160,000 pounds	1022
88.	Earnings, rates and costs for multiple-car movements originating in southern territory, actual weight group: 70,001 to 100,000 pounds	1022
89.	Earnings, rates and costs for multiple-car movements originating in southern territory, actual weight group: 100,001 to 130,000 pounds	1022
90.	Earnings, rates and costs for single-car movements originating in western territory, actual weight group: 40,001 to 70,000 pounds	1022
91.	Earnings, rates and costs for single-car movements originating in western territory, actual weight group: 70,001 to 100,000 pounds	1023
92.	Earnings, rates and costs for single-car movements originating in western territory, actual weight group: 100,001 to 130,000 pounds	1023

Table No.	Table name	Page No.
93.	Earnings, rates and costs for single-car movements originating in western territory, actual weight group: 130,001 to 160,000 pounds	1024
94.	Earnings, rates and costs for single-car movements originating in western territory, actual weight group: 160,001 to 190,000 pounds	1025
95.	Earnings, rates and costs for multiple-car movements originating in western territory, actual weight group: 100,001 to 130,000 pounds	1005
96.	Earnings, rates and costs for multiple-car movements originating in western territory, actual weight group: 130,001 to 160,000 pounds	1025
97.	Number and percent of movements of scrap iron and steel having revenues below variable and fully allocated costs, by origin territories and by type of shipment	1029
98.	Number and percent of representative movements having revenues below their variable and fully allocated costs by weight groups	1031
99.	Frequency distribution of total movements, all weight groups	1032
100.	Frequency distribution of single-car movements, all weight groups	1033
101.	Frequency distribution of single-car movements, official territory, all weight groups	1034
102.	Frequency distribution of single-car movements, southern territory, all weight groups	1035
103.	Frequency distribution of single-car movements, western territory, all weight groups	1036

Table No.	Table name	Page No.
104.	Frequency distribution of single-car movements, weight group 40,000 to 70,000 pounds	1037
105.	Frequency distribution of single-car movements, weight group 70,001 to 100,000 pounds	1038
106.	Frequency distribution of single-car movements, weight group 100,001 to 130,000 pounds	1039
107	Frequency distribution of single-car movements, weight group 130,001 to 160,000 pounds	1040
108.	Frequency distribution of single-car movements, weight group 160,001 to 190,000 pounds	1041
109.	Frequency distribution of multiple-car movements, all weight groups	1042
110.	Frequency distribution of multiple-car movements, official territory groups	1043
111.	Frequency distribution of multiple-car movements, southern territory, all weight groups	1044
112.	Frequency distribution of multiple-car movements, western territory, all weight groups	1045
113.	Frequency distribution of multiple-car movements, weight group 70,001 to 100,000 pounds	1046
114.	Frequency distribution of multiple-car movements, weight group 100,001 to 130,000 pounds	1047
115.	Frequency distribution of multiple-car movements, weight group 130,001 to 160,000 pounds	1048
116.	Frequency distribution of multiple-car movements, weight group 160-001 to 190,000 pounds	1049
117.	1972 waybill tape comparisons -----	1053

Table No.	Table name	Page No.
118.	Consultant's cost reductions----	1054
119.	Consultant's calculation of revenue above variable costs (contribution) for a random sample of iron ore and ferrous scrap traffic, 1972, by cost region and mileage block	1056
120.	Consultant's comparison of "contribution" by scrap and ore traffic, based on sample from 1972 waybill sample with contribution by ore equal to 100	1058
121.	Comparison of consultant's sample with 1972 DOT carload waybill statistics and 1972 ICC Freight Commodity Statistics	1059
122.	Comparison of consultant's official territory statistics	1060
123.	Comparison of consultant's southern territory statistics	1061
124.	Comparison of consultant's statistics with southern railway operating data	1061
125.	Scrap iron contribution comparison	1062
126.	Average haul per car in the United States, iron ore compared with iron and steel scrap	1065
127.	Single-car and multiple-car movements in waybill file	1070
128.	Reduction in terminal costs due to reduced engine minute expenses	1070
129.	Southern Railway scrap sample averages.	1073

Table No.	Table Name	Page No.
130.	Permanent increases allowed on ores and scrap iron and steel after January 1, 1972.	1077
131.	Permanent and temporary increases allowed on iron ores and scrap iron and steel after January 1, 1972.	1078
132.	Consultant's cost reductions----	1081
133.	Railroad revenue and variable cost for study moves by distance blocks.	1083
134.	Contribution to railroad revenue by study moves in distance blocks.	1084
135.	Iron ore--TD-I------------------	1090
136	Statements of intercommodity rate and revenue cost relationship between scrap iron and steel and iron ores.	1092
137.	Iron ore-------------------------	1094
138.	Statement of intercommodity rate and revenue/cost relationship between scrap iron and steel and iron ores, scrap iron and steel.	1097
139.	Iron ore------------------------	1098
140.	Statement of intraterminal and interterminal switching of scrap iron and steel at Birmingham, Ala., Atlanta, Ga., and Chattanooga, Tenn., during the period March 13 through April 15, 1974.	1101
141.	Revenue contribution to burden and other data, by commodity classes and territorial movements.	1117

Table No.	Table Name	Page No.
142.	Decline in scrap revenue contribution.	1123
143.	Iron and steel scrap--------------	1124
144.	Iron ores------------------------	1124
145.	Originations and revenue, iron and steel scrap, wastes and tailings, STCC 40211, 1966-1973, United States.	1129
146.	Originations and revenue, iron and steel scrap, wastes and tailings, STCC 40211, 1966-1973, eastern territory.	1129
147.	Originations and revenue, iron and steel scrap, wastes and tailings, STCC 40211, 1966-1973, southern territory.	1129
148.	Originations and revenue, iron and steel scrap, wastes and tailings, STCC 40211, 1966-1973, western territory.	1130
149.	Percentage of total U.S. revenue from movements of iron and steel scrap, wastes and tailings, STCC 40211, received by eastern, southern and western territory railroads, 1966-1973.	1131
150.	Relationship of scrap iron and steel originated freight and revenue to all carload revenue freight traffic southern district.	1132
151.	Average revenue per ton on scrap iron and steel originated by southern district class I railroads.	1137
152.	Average revenue per ton on scrap iron and steel originated by southern district class I railroads in constant dollars.	1138

Table No.	Table Name	Page No.
153.	1973 Freight revenue comparison, scrap iron versus gross railway operating revenue for western railroads.	1140
154.	The Atchison, Topeka and Santa Fe scrap revenue data.	1141
155.	Burlington Northern, Inc., scrap revenue data.	1141
156.	Chicago, Milwaukee, St. Paul and Pacific scrap revenue data.	1142
157.	Chicago and North Western scrap revenue data.	1142
158.	Chicago, Rock Island and Pacific scrap revenue data.	1142
159.	Denver and Rio Grande Western scrap revenue data.	1143
160.	Duluth, Missabe & Iron Range RR scrap revenue data.	1143
161.	Elgin, Joliet & Eastern Railway Co. scrap revenue data.	1143
162.	Statement indicating movements of scrap iron transported by the ICG during the years 1967-1973.	1144
163.	Illinois Terminal R.R. Co. scrap revenue data.	1145
164.	Lake Superior & Ishpeming scrap revenue data.	1145
165.	Statement showing movements of scrap iron and steel via the Louisville and Nashville Railroad, systemwide, for the years 1967 through 1973, as reported in the Quarterly Commodity Statistics filed with the Interstate Commerce Commission.	1146
166.	Missouri-Kansas-Texas R.R. scrap revenue data.	1147
167.	Missouri Pacific Railroad Company scrap revenue data.	1147

Table No.	Table Name	Page No.
168.	Freight Commodity Statistics--carload movements—scrap iron and steel, St. Louis-San Francisco Railway Company.	1148
169.	St. Louis-San Francisco Railway Company scrap revenue data.	1149
170.	Statement showing the movement of scrap iron transported by the Seaboard Coast Line Railroad during the years 1967 through 1973.	1150
171.	Relationship of scrap iron and steel originated and total traffic and revenues to all carload freight traffic, Southern Railway System.	1151
172.	Average revenue per ton scrap iron and steel originated by Southern Railway System.	1152
173.	Average revenue per ton scrap iron and steel handled by Southern Railway System.	1152
174.	Average revenue per ton all freight traffic other than scrap iron and steel handled by Southern Railway System.	1153
175.	Average revenue per ton scrap iron and steel handled by Southern Railway System in constant dollars.	1153
176.	Average revenue per ton all freight traffic other than scrap iron and steel handled by Southern Railway System in constant dollars.	1154
177.	Texas and Pacific Railway Company scrap revenue data.	1154
178.	Lowest, highest and simple average ratio of rate to variable cost by commodity, originating territory, type of shipment and corresponding actual miles.	1168

Table No.	Table Name	Page No.
179.	Simple average rate-to-fully-allocated-cost ratios on single-car scrap shipments and multiple-car and trainload iron ore shipments originating in the official territory.	1169
180.	Simple average ratio of rate to variable cost by commodity, originating territory, type of shipment and by weight groups.	1171
181.	Simple average ratio of rate to variable cost by commodity, originating territory, mileage blocks and type of shipment.	1174
182.	Territory and type of low ratio movements of scrap iron and steel, 1973.	1183
183.	Low ratio movements of scrap iron and steel by mileage, 1973.	1183
184.	Territory and type of high ratio movements of scrap iron and steel, 1973.	1184
185.	High ratio movements of scrap iron and steel by mileage, 1973.	1185
186.	Scrap iron and steel revenue per ton carried, 1966-1973.	1187
187.	Iron and steel scrap, railroad tonnages and revenue.	1187
188.	Iron and steel scrap, wastes and tailings (tons, revenue, and revenue per ton).	1188
189.	Loaded trips per car per year---	1189
190.	Statements showing the time lag, in days, between the effectiveness of ex parte increases on interstate and intrastate traffic in Southern States.	1194
191.	Near term percentage charges in residuals for changes in the freight rates.	

Figure No.	Figure Name	Page No.
1.	Scrap availability/generation--	877
2.	Generation of scrap by major categories.	878
3.	Source and magnitude of scrap used in steel production.	879
4.	Flow diagram of scrap industry-	882
5.	Relationship between monthly scrap supply and three-city No. 1 heavy melting A.M.M. composite price.	885
6.	Obsolete scrap generation and three-city No. 1 HM scrap composite price—A.M.M.	886
7.	No. 1 heavy melting steel composite scrap steel prices per gross ton—Pittsburgh, Chicago, and Philadelphia.	888
8.	Iron and steel scrap supply and sales.	889
9.	Comparison of price and sales of scrap iron, October 1972-July 1974.	890
10.	Composite average of No. 1 heavy melting steel scrap prices at Pittsburgh, Philadelphia, and Chicago, showing annual range of the scrap steel prices.	903
11.	Flow diagram of steelmaking process.	917
12.	Blast furnace operation---------	948
13.	Open hearth production of steel-	950
14.	Steel production by the basic oxygen process.	952
15.	Electric arc process for production of steel.	954
16.	Casting processes for steel prepartion.	956
17.	Iron foundry process flow sources of emissions.	958
18.	Scrap iron rate scales South to official.	997

Figure No.	Figure Name	Page No.
19.	Scrap iron rate scales within south.	1007
20.	Scrap iron scale and commodity rates.	1008
21.	Representative single-car rates on actual carloadings between 20 and 50 net tons on scrap iron originating in official territory.	1104
22.	Representative single-car rates on actual carloadings between 50 and 65 net tons on scrap iron originating in official territory.	1105
23.	Representative single-car rates on actual carloadings between 65 and 125 net tons on scrap iron originating in official territory.	1106
24.	Representative multiple-car rates on actual carloadings between 35 and 110 net tons on scrap iron originating in official territory.	1107
25.	Representative single-car rates on actual carloadings between 20 and 50 net tons on scrap iron originating in southern territory.	1108
26.	Representative single-car rates on actual carloadings between 50 and 65 net tons on scrap iron originating in southern territory.	1109
27.	Representative single-car rates on actual carloadings between 65 and 125 net tons on scrap iron originating in southern territory.	1110

Figure No.	Figure Name	Page No.
28.	Representative multiple-car rates on actual carloadings between 35 and 110 net tons on scrap iron originating in southern territory.	1111
29.	Representative single-car rates on actual carloadings between 20 and 50 net tons on scrap iron originating in western territory.	1112
30.	Representative single-car rates on actual carloadings between 50 and 65 net tons on scrap iron originating in western territory.	1113
31.	Representative single-car rates on actual carloadings between 65 and 125 net tons on scrap iron originating in western territory.	1114
32.	Representative multiple-car rates on actual carloadings between 35 and 110 net tons on scrap iron originating in western territory.	1115
33.	Relationship scrap iron tons originated to all other traffic southern district carriers.	1134
34.	Relationship scrap iron revenues to all other traffic southern district carriers.	1135
35.	Revenue per ton southern district-	1136
36.	Revenue per ton on scrap iron in constant dollars.	1139
37.	Revenue per ton Southern Railway--	1155
38.	Revenue per ton Southern Railway in constant dollars.	1156
Map 1	Location of steel mills in the United States.	914

APPENDIX A

Source references

No. Title

1. Adams, R. L. and S. E. Milanes, *An Economic Analysis of the Junk Auto with Emphasis on Processing Costs,* U.S. Bureau of Mines, 1972.
2. American Iron and Steel Institute, *Annual Statistical Report 1971,* Washington, D.C., 1972.
3. American Iron and Steel Insitute, *Annual Statistical Report 1972,* Washington, D.C., 1973.
4. Barnes, T. M. and H. W. Lownie, Jr., *A Cost Analysis of Air-Pollution Controls in the Integrated Iron and Steel Industry,* National Technical Information Center, Springfield, Va.
5. Battelle Memorial Institute, Columbus Laboratories, *Study to Identify Opportunities for Increased Solid Waste Utilization,* Vol. I-IX. 1972. National Technical Information Center, Springfield, Va.
6. Bravard, J. C., H. B. Flora II, and C. Portal, *Energy Expenditures Associated with the Production and Recycle of Metals,* Oak Ridge National Laboratory, Oak Ridge, Tenn., 1972.
7. Cannon, J. S., and J. Adams, *Environmental Steel--Pollution in the Iron and Steel Industry,* The Council on Economic Priorities, New York, N.Y., 1973.
8. Jacobsen, W. E., and J. T. Stone, *Environmental Considerations in Future Energy Growth--Vol. II Energy/Environmental Factors in Transportation 1975-1990,* The MITRE Corporation Washington, D.C., 1973.
9. Kearney (A. T.) & Company, Inc., *Systems Analysis of Emissions and Emission Control in the Iron Foundry Industry, Vol. I--Test, Vol. II--Exhibits, 1971,* National Technical Information Center, Springfield, Va.

Source references--Continued

No. Title

10. Kearney (A. T.) & Company, Inc., *Air Pollution Aspect of the Iron Foundry Indstury*, 1971, National Technical Information Center, Springfield, Va.

11. Kuhl, R. J., "Metallics for Electric Furnace Steelmaking," *Electric Furnace Proceedings*, Vol. 27: 116-122, The Metallurgical Society, A.I.M.E., New York, N.Y., 1969.

12. Leary, R.J., and G.M. Larwood, *Effects of Direct Reduction upon Mineral Supply Requirements for Iron and Steel Production*, U.S. Bureau of Mines, Washington, D.C., 1973.

13. Midwest Research Institute, *Particulate Pollutant System Study Volume III--Handbook of Emission Properties*, May 1971.

14. National Petroleum Council, *U.S. Energy Outlook - Coal Availability*, Washington, D.C., 1973.

15. Nelson, J. P., *An Interregional Recursive Programming Model of the U.S. Iron and Steel Industry: 1947-1967*, Ph.D. Dissertation, The University of Wisconsin, Ann Arbor, 1970.

16. Perry, J. H., *Chemical Engineers Handbook*, McGraw Hill, New York, N.Y., 1950.

17. Regan, W. J., R. W. James, and T. J. McLean, *Identification of Opportunities for Increased Recycling of Ferrous Solid Waste*, Insitute of Scrap Iron and Steel, Inc., 1972, available from National Technical Information Center, Springfield, Va.

18. Research-Cottrell, Inc., *The Research-Cottrell Bahco Process--A Proved Commercial Way to Control* SO_2 *Emissions*, Bound Brook, N.J., 1973.

19. Stone, J. K., "Increasing Scrap Usage by the L-D Process--Theory, Practice, and Prospect," *Iron and Steel Engineer* 40(6): 67-78, 1963.

Source reference--Continued

No. Title

20. Tsao, C. S., and R. H. Day, "A Process Analysis Model of the U.S. Steel Industry,'' *Management Science* 17(10): B588-B608, 1971.

21. U.S. Bureau of Mines, *Mineral Facts and Problems, 1970,* U.S. Government Printing Office, Washington, D.C., 1970.

22. U.S. Bureau of Mines, *Minerals Yearbook 1966 Vol. I Metals, Minerals and Fuel,* U.S. Government Printing Office, Washington, D.C., 1966.

23. U.S. Bureau of Mines, *Minerals Yearbook 1967 Vol. I Metals, Minerals and Fuel,* U.S. Government Printing Office, Washington, D.C., 1968.

24. U.S. Bureau of Mines, *Minerals Yearbook 1968 Vol. I Metals, Minerals and Fuel,* U.S. Government Printing Office, Washington, D.C., 1969.

25. U.S. Bureau of Mines, *Minerals Yearbook 1969 Vol. I Metals, Minerals and Fuel,* U.S. Government Printing Office, Washington, D.C., 1970.

26. U.S. Bureau of Mines, *Minerals Yearbook 1970 Vol. I Metals, Minerals and Fuel,* U.S. Government Printing Office, Washington, D.C., 1971.

27. U.S. Bureau of Mines, *Minerals Yearbook 1971 Vol. I Metals, Minerals and Fuel,* U.S. Government Printing Office, Washington, D.C., 1973.

28. U.S. Bureau of Mines, *Minerals Yearbook 1972 Vol. I Metals, Minerals and Fuel,* U.S. Government Printing Office, Washington, D.C., 1974.

29. U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors,* Second Edition, Research Triangle Park, N.C., 1972.

Source reference--Continued

No.	Title
30.	U.S. Federal Water Pollution Control Administration, *The Cost of Clean Water. Vol. II Industrial Waste Profiles, No. 1--Blast Furnace and Steel Mills,* U.S. Government Printing Office, Washington, D.C., 1967.

EX PARTE NO. 270 (SUB-NO. 2)

INVESTIGATION OF RAILROAD FREIGHT SERVICE

Decided March 18, 1976

Upon consideration of representations in Ex Parte No. 270 and the records in Ex Parte Nos. 265 and 267, and upon investigation into alleged and admitted deficiencies in railroad freight service, and other related matters:

1. The Commission found to have the jurisdiction and statutory authority to conduct an investigation and to make appropriate findings with respect to rail freight service deficiencies.
2. Railroad freight service found to be not sufficient to meet shippers demands; general plans suggested to halt further material service deterioration and to correct service deficiencies; and suggestions made that a greater and more extensive publication of service schedules be made in publications generally consulted by the shippers.
3. Examination of recommended proposals that the Commission (a) adopt and implement a plan of reciprocal demurrage; (b) establish alternate freight structures; (c) require the earmarking of certain percentages of future rate increases for equipment improvements; (d) require publication of empty car movement schedules; (e) sponsor shipper-carrier conferences; and (f) define reasonable dispatch.
4. Examination of labor-management relations in the railroad industry.
5. Rulemaking proceedings suggested for the purpose of (a) defining the concept of reasonable dispatch for nonperishable commodities; and (b) establishing terminal operation schedules.
6. Further study recommended in the areas of (1) contract rates for rail service; (2) assigned and special car allocation; (3) circuitous routing of freight cars; (4) billing and forwarding information; (5) demurrage and free-time allowances; (6) railroad electrification; and (7) utilization of "short trains."
7. Appropriate order entered closing this phase of the Sub-No. 2 proceeding. A table of contents is set forth in appendix F.

Joseph O. Anthofer, John J. Burchell, John A. Daily, Harry L. DeLung, Jr., Louis T. Duerinck, R.S.M. Emrich III, Charles B. Evans, Joseph D. Feeney, Louis A. Harris, Richard W. Kienle, Howard D. Koontz, Albert W. Laisy, Charles N. Marshall, John P. McCall, Donald McDewitt, Richard Mehley, Thormund A. Miller, Joseph J. Nagel, Albert B. Russ, Jr., James L. Tapley, and *Donald L. Turkal* for respondents.

William E. Casselman II, Leonard M. Shinn, and *Maurice J. Street* for the General Services Administration.

Constance L. Abrams, John W. Barnum, Rodney E. Eyster, William A. Kutzke, and *James C. Schultz* for the United States Department of Transportation.

Frank E. Palom for the Board of Trade of Chicago, Ill.

Jon C. Hansen for the Board of Trade of Kansas City, Mo.

Ralph H. Bell, Jacob P. Billig, William L. Bush, Robert L. Calhoun, Edward B. Frankel, John W. Gillus, William H. Harr, Richard Harrington, Jons S. Hoff, Walter Hoffman, W. H. Hollan, James J. Irlandi, Terrence D. Jones, Louis Karfiol, William J. Keating, John H. King, Rodman Kober, Norbert J. Leiberg, James R. Mann, E. Alan Mills, W. R. Moran, Robert B. Reedy, David M. Schwartz, Anthony J. Skul, Myron Smith, William K. Smith, Wilson W. Snyder, Oliver L. Stewart, Tyrus C. Stewart, J. Langhorne Topkins, John C. Vaccaro, Robert W. Walters, and *Henry J. Yunck* for shippers and shipper organizations.

Herbert O. Witten appearing as a transportation consultant.

Leonard S. Goodman, William R. Southard, Gilbert A. Mehling, and *John M. Vittone,* Special Projects Staff of the Bureau of Enforcement.

REPORT OF THE COORDINATOR

HARDIN, *Commissioner:*

In response to the numerous complaints of continuing rail service deficiencies, the Commission on November 15, 1971, instituted this proceeding, *Investigation of Railroad Freight Service,* 341 I.C.C. 1. The prior report detailed the most frequent complaints as: failure to meet schedules, terminal delays, erratic deliveries, bunching of deliveries, and placing of cars unfit for use. The railroads admitted the validity of the claimed need for service improvement. The particular areas where appreciably improved service is required include: terminal delays, interchange delays, erratic deliveries, deliveries not reasonably timed or spaced, and car shortages or misallocations.

The prior report indicated that the relevant portions of the records made in Ex Parte Nos. 265 and 267, *Increased Freight Rates, 1970 and 1971,* 339 I.C.C. 125 (1971), will be considered a part of the record in this proceeding, including the advisability of imposing sanctions for particular service deficiencies.

To aid in delineating service deficiencies and devising methods of eliminating them, the prior report requested shippers to compile and mail to the nearest ICC regional director a "Railroad Freight Service Report" (Form BOp 105). The form was revised by order entered March 23, 1972 (notice of which was published in the Federal Register on April 13, 1972, 37 F.R. 7369). Appendix G to this report details the results of these findings.

The Commission also invited participating parties to submit their views and comments upon: (1) practical and meaningful guidelines relating to the quality of railroad freight service; (2) standards concerning the quality of that service; (3) measures of performance against those standards; and (4) necessary controls to improve and maintain performance standards. A number of participants in the predecessor general rail freight rate increase proceedings mentioned above submitted additional representations, and the views so expressed are summarized in appendix A to this report.

Nationally, some 70 percent of the railroad freight traffic is handled on an interchange basis involving more than one railroad. The coordination of railroad operations utilizing this nationally integrated system, to the extent that it has occurred, has facilitated industrial expansion. Railroads are, and will continue to be, a crucial link in our overall system of production and distribution. Given the fact of a national system, any prolonged interruptions or other inadequacies in rail service seriously affect not only the carrier or carriers directly involved and their patrons but also the operations of other railroads and industry generally throughout the country. The real significance of this network concept, however, lies in the plain fact that rail service can be improved only to the level of the service quality of the weakest link in the chain of any given traffic movement.

The requirement of the submission of data relating to service in Ex Parte Nos. 265 and 267, *supra,* the institution of these proceedings, and the appointment on July 13, 1973, of this Commissioner as Coordinator of this proceeding all demonstrate an awareness on the part of the Commission that there must be service improvements. Confronted with prospects of general freight rate increases authorized in recent decisions of the Commission, many users of rail service presented substantial evidence pointing toward what they have characterized as a "crisis" in rail transportation service. These users believe, furthermore, that the authorization of increased rates for the rail system should be conditioned upon the provision of adequate service. In light of recognized service deficiencies, they feel shortchanged by the granting of rate increases without a concomitant provision of improved freight service.

Respondents,[1] on the other hand, argue that spiralling costs make higher rates mandatory; that service-related problems can be alleviated only by the availability of capital and operating funds such higher rates would generate; and that customer orientation and management motivation to improve service are not lacking in the railroad industry.

In *Increased Freight Rates, 1970 and 1971, supra,* at p. 260, the Coordinator commenced a discussion of service in the following manner:

> I share the majority's concern for the well-being of the railroad industry. Indeed, if it were not for this concern and the definite showing of revenue need by the railroad industry in their almost desperate effort to stave off future bankruptcies, based on the service deficiencies in this record I would be inclined to disapprove the general rate increases at issue in these consolidated proceedings. Obviously, these service deficiencies make it extremely difficult to conclude that the proposed increases are just and reasonable, when it is realized that the shippers of this country are being called upon to pay substantially higher rates in 1971 for service that in many instances is inferior to that accorded traffic in the 6-year period, 1960-1966, of rail rate stability preceding the filing of Ex Parte No. 256, *Increased Freight Rates, 1967,* 329 I.C.C. 854, 332 I.C.C. 280.

The Coordinator is pleased to note that during the pendency of this proceeding the Commission has acted affirmatively to correct service dfeiciencies; an example of this affirmative action is the order entered June 4, 1974, in Ex Parte No. 305, Nationwide Increase of Ten Percent in Freight Rates and Charges, 1974. That order will be discussed later herein in connection with a specific proposal to require the earmarking of percentages of revenue.

THE EVIDENCE

As indicated above, both the railroads and their users widely recognize the need for service improvements. However, the parties to this proceeding have generally failed to present well-documented evidence sufficient to permit the adequate resolution of the various issues presented herein. This failure has been a great disappointment to the Coordinator, and has required the recommendation of additional investigations and rulemakings to fill the evidentiary voids.

Indicative of the lack of full cooperation in this proceeding are the form BOp 105 reports. As previously mentioned, the prior report herein initiated a service complaint program[2] in order to monitor service failures and the responses thereto by each railraod involved in a complaint.

---

[1] Some 70 class I line-haul railroads representing about 99 percent of the rail industry in terms of traffic, concede generally a need for improvement in freight service and vigorously express their desire to accomplish such improvement.

Only 474 service deficiency reports have been filed with the Commission by various rail shippers as of September 15, 1974. (See appendix G.) However, numerous comments concerning these reports are contained in the statements submitted by the 32 shippers and shipper organizations whose names appear in appendix A, and by respondents. Respondents reflect a general acquiesence in the basic reporting procedures and requirements of form BOp-105. Indeed, some respondents have found support in the forms and argue that when the small number of complaints is considered in light of the total traffic volume handled annually, no significant or pervasive problem concerning rail freight service can be said to exist. One carrier contends that analysis of the complaints filed against it reveals that alleged service deficiencies were the result of mere inadvertence or "human error" and not the product of any willful or conscious indifference to the needs or requests of shippers.

Shippers uniformly oppose the reporting procedure. Essentially they object to the time and detail required for processing complaints and the resultant paperwork burden placed upon those who must prepare them. They also believe that the form is too burdensome to accomplish its intended purpose. Some shippers would place responsibility for gathering the desired information upon the Commission or the respondents. Other shippers advocated changes in procedure with respect to form BOp 105. One shipper recommends that, in lieu of the lengthy form, a monthly report for a specific test period be filed with the Commission covering specific areas of service such as transit time, plant switching, terminal delays, car shortages, unsuitable equipment, and other service complaints.

---

[2] The procedure for filing service complaints is as follows: Upon experiencing a service failure or deficiency, a railroad's customer may complete form BOp-105 in duplicate; a copy is then mailed to the Commission's nearest regional director and one to the railroad involved. The Commission then acknowledges receipt thereof and both the shipper and the railroad are informed of the assigned identification and code number which is to be used in all further statements and correspondence. Within 30 days after a shipper files a complaint, the rail carrier involved must file a reply to the same regional director, with a copy to the shipper. The reply must indicate the corrective action taken or other appropriate response. Within 30 days of the railroad's reply statment the shipper may file a further statement to the same regional director, with a copy to the railroad, indicating that the service deficiency has not been corrected. If the latter statement is not filed, the service deficiency is presumed to have been corrected. Whenever a shipper's final statement indicates that the service deficiency has not been alleviated, the Commission attempts to take appropriate corrective action.

It was hoped that instituting the standardized complaint procedure would afford shippers a supervised means of alleviating specific service problems and, coincidently, provide an opportunity to present evidence for the purpose of facilitating and simplifying presentations in this proceeding. The summary of complaint data set forth in appendix G to this report indicates that only a few shippers have participated in the reporting program. Because of this, the Commission's program summary represents only a narrow sample of the entire shipper population. The data, moreover, disproportionately concentrate on service deficiencies involving only a small group of railroads. For example, 43 deficiencies were reported against the Lehigh and New England Railroad. Virtually all of the 90 deficiencies pertaining to the service of the Norfolk and Western were reported by a single shipper. Accordingly, the complaints of shippers and the responses by the involved railroads, as reported in the BOp-105 program, are of limited probative and practical value in this proceeding. The Coordinator's subsequent application of these data with respect to nationwide rail service and its deficiencies will reflect its limited probative value.

As of January 1, 1976, respondents have filed 19 quarterly reports pursuant to the order entered March 4, 1971, in Ex Parte Nos. 265 and 267. The prior report herein announced the Commission's intention periodically to issue public statements indicating for each railroad the number and kinds of service complaints and the action taken thereon. The first eight of respondents' reports are summarized in appendix B to this report.

The reports of July 1 and October 1, 1971, failed to reveal that respondents had taken steps necessary to correct those service problems pointed out in the earlier decision in Ex Parte Nos. 265 and 267. Despite the fact that there are approximately 70 class I line-haul railroads, the first reports filed by respondents' representative, the Association of American Railroad (AAR), contain only piecemeal data supplied by 21 carriers. Listed in the reports are physical plant improvements in certain yards and operational changes such as preblocking and programs for improved car and power utilization. Quarterly reports dated January 1, April 1, July 1, and October 1, 1972, contain similar, and oftentimes repetitive, information. Subsequent quarterly reports have been somewhat more expansive in the there are more topics covered, yet the general effect is to support the self-serving allegation that service improvements are occurring and that this proceeding is not necessary.

Additional representations.—The initial statements submitted by shippers and receivers contain various allegations of transit and terminal delays, car shortages, weighing and billing errors, mechanically defective cars, erratic deliveries, and deliveries not reasonably timed or spaced. Some of these complaints are documented by supportive data or logistical studies made by the shippers involved. In all, the types of complaints registered with the Commission are as diverse as the commodities dealt in by the shippers and receivers and reflects the distinctive features of their service requirements.[3]

Generally, the complaints direct one's attention to several specific and seemingly fundamental causes of erratic service. Examples of transit, terminal, and interchange delays and deliveries not reasonably timed or spaced (the so-called bunching of cars) dominate the shippers' representations. As one shipper put it, the mere movement of a carload of freight does not fulfill a carrier's obligation to a shipper. Rather, it is averred that a loaded car must arrive within a time period in which the lading is scheduled for input into marketing, production, or other facets of industrial and commercial activity. Respondents failed to reply specifically to the assertion. Shippers also contend that a more consistent service would result in improved utilization of existing equipment. Participating shippers and receivers indicate their willingness to accept longer transit times provided consistent delivery schedules are maintained.

The remedial proposals made by the shippers also vary substantially. For example, the California Grape & Tree Fruit League recommends that additional "unit-train" service be instituted, while the Glass Container Manufacturers' position calls for an investigation into the tendency of railroads to operate longer trains. The latter believes that unit trains may possibly be a significant contributing factor to transit delays, the bunching of cars, and erratic service in general. However, such wide differences in position are rare.

Virtually without exception, shippers' initial statements criticize existing service and emphasize the need for reform in the railroad industry. Basically their corrective proposals direct the Commission's attention toward the following measures: (1) publication of freight service schedules; (2) a system of reciprocal demurrage; (3) a definition by the Commission of the term "reasonable dispatch"; (4) a dual-incentive rate structure; (5)

---

[3] The positions of the parties are described in detail in appendix A of this report.

application of an earmarked percentage of revenue derived from rate increases to specific types of capital expenditures; (6) investigation of terminal operations and the movement of empty cars; and (7) shipper-carrier conferences. They propose that future rate increases be made integrally dependent upon carrier management's performance in meeting objective service standards and they urge the Commission to establish such standards in this proceeding.

Statements in reply.—Respondents filed a number of comprehensive representations in answer to those submitted by shippers. These pleadings embrace, on behalf of all railroads which may be affected by the outcome of this investigation, arguments as to the enormity of the task and impracticability of requiring railroads to publish dock-to-dock service schedules. Detailed descriptions are also given of various innovations which railroads have planned and which, to some extent, have been implemented in an effort to control their operations, improve their communications, and upgrade the quality of their service. Data on expenditures by railroads to improve their facilities, equipment, and the quality of their service are set forth in detail. In addition, a statement by an official of the Operations and Maintenance Department of AAR summarizes respondents' individual pleadings and offers evidence intended to rebut specific criticisms and proposals of nonrailroad interests. Also embodied in this statement is the complete rejection of the notion that the primary problem in rail service today is a lack of motivation on the part of railroad management to improve service.

Respondents' representations reveal that many improvements already have been realized from the efforts of individual railroads. Research into the problems of the industry as a whole has been undertaken by the AAR. The latter, according to its tradition, has devoted its efforts to solving problems which relate to industrywide technical standards and equipment requirements. These efforts have accounted for cost reductions and the improved capacity of railroads generally to provide a better quality of service. Many programs which respondents have begun are still incomplete; some, they say, will not be completed until some years hence. The Coordinator is mindful of the fact that large capital expenditures are required to modernize our Nation's railroad plant and that this necessarily creates a situation in which some changes will come about more slowly than others. The conversion from steam to diesel locomotives, for example, took approximately 20 years to accomplish. Accordingly, this factor had been taken into account in his evaluation of the proposals made by all participants in this proceeding.

The main thrust of respondents' argument is that railroads are, as always, constantly aware of the importance of good service and that they continuously have been doing all they possibly can to improve the quality of the services they provide. They content, however, that they are severely handicapped in their efforts because of their inability to attract capital and to increase their operating revenues. Recently, the Congress passed, and the President signed, a bill entitled "The Railroad Revitalization and Regulatory Reform Act of 1976," P.L. 94-210 (RRRRA). This legislation contains provisions for railroad rehabilitation and improvement financing. While these provisions will be helpful to railroads in refurbishing their facilities, the full effect of the aid will not be calculable for many years. Therefore, this legislation is not a cureall for the problems the railroads now suffer.

Although indicating a willingness to accept the basic reporting procedures of form BOp-105, respondents oppose the prescription of any correcitve regulations with respect to service deficiencies. The basis for their opposition is the claim that they are entitled, under the Administrative Procedure Act, to prior notice of the terms or substance of proposed rules. Respondents aver that a procedure which allows for undescribed sanctions by the Commission would serve no purpose if it were based upon only a few situations in which corrective action had not been taken to satisfy a particular complainant.

The paucity of shipper interest in BOp-105 as reflected in the lack of usage lends to the conclusion that the form has been shown to be an ineffective information gathering tool, and its use should be discontinued; any substituted form to meet the shippers' objections would lack the detail needed to provide a workable information base.

Respondents contend that the Commission not only lacks the requisite statutory authority to prescribe regulations governing their operations, but also that the agency has specifically disclaimed jurisdiction over disputes founded upon delay in the delivery of shipments. In this respect they rely primarily upon the decisions in *United States* v. *Pennsylvania R. R. Co.*, 242 U.S. 208 (1916), and *Badger Lumber & Coal Co.* v. *Atchison, T. & S. F. Ry. Co.*, 156 I.C.C. 427 (1929).

Proposals such as the application of reverse or reciprocal demurrage, two-level rates, and rate reductions, which have been suggested by several shippers, are, respondents argue, essentially awards of damages for loss of profits resulting from delays in transit. They contend that the Commission lacks power to prescribe rules and regulations having such effect. Moreover, respondents aver that in the *Pennsylvania* case, *supra,* the Supreme Court held that the Interstate Commerce Act does not confer upon the Commission jurisdiction to regulate, as a "practice," the operations of a rail carrier. They go on to say that only a court, by means of an injunction, may enforce a railroad's duty to receive and transport property. They represent that in all probability Congress concluded that it was unnecessary to confer such power on the agency because the courts already had been given it. In support of this position, they rely upon *Peoria & P. U. Ry.* v. *United States,* 263 U.S. 528 (1924).

Respondents further point out that with the sole exception of the decision in Ex Parte No. 241,[4] the Commission has not exercised jurisdiction over the operations conducted by railroads subject to the Interstate Commerce Act. They insist that where injury results from improper railroad operations, the remedy therefor lies in the courts.

Respondents submit that although the Commission has the expertise required to *regulate* railroads from an economic standpoint, an entirely new level of data and personnel would be required to evaluate rail management's operational decisions. Without the agency's having a close association with the day-to-day operations of carriers, arbitrary judgments assertedly would be made by the Commission. According to respondents, the astronomical number of routes and route combinations involved in railroad operations today precludes the Commission's establishing a requirement that they publish dock-to-dock or even city-to-city schedules. They say this could not possibly be accomplished and that the expense of developing such schedules would be beyond the resources of the rail industry. Should the Commission require the publication of schedules, respondents believe, low performance standards would have to be established in order to guard against all possible operating contingencies. Because it is their judgment that the publication of valid schedules is impossible, respondents argue that reverse demurrage, two-level rates, and rate-reduction systems would have no useful purpose or practical application.

---

[4] The report and order of division 3 in Ex Parte No. 241 appears at 335 I.C.C. 264. Subsequently the entire Commission entered an order as a matter of general transportation importance (335 I.C.C. 874). That order was later modified (341 I.C.C. 64). The action in Ex Parte No. 241 was affirmed in part in *Allegheny-Ludlum Steel Corp.* v. *United States, et al.*, 325 F. Supp. 352 (W.D. Pa. 1971), and entirely in *Florida East Coast Railway Company* v. *United States*, 327 F. Supp. 1076 (M.D. Fla. 1971). In *United States* v. *Allegheny-Ludlum Steel Corp.*, 406 U.S. 742 (1972), the Supreme Court sustained the Commission's claim of jurisdiction to regulate railroads subject to the act by the promulgation of car service rules pursuant to powers conferred by section 1(14)(a). The rules there adopted basically require that unloaded freight cars be returned in the direction of the lines of the road owning such cars.

Respondents maintain that their progress in developing and employing informational and control systems attests to the existence and adequacy of their motivation to improve service quality; that a "shipper-be-damned" attitude is inconsistent with good business judgment because carriers have only their services to sell; and that the lack of resources rather than motivation is the essential reason why all railroads do not have the same capability now to provide service of a higher quality.

After expressing the full realization of a duty to provide reasonably satisfactory service, respondents aver that there can be little doubt about the fact that acts of God and those of shippers and consignees themselves contribute to at least some of the elements of erratic service which occur from time to time. They claim to be powerless to do anything about those causal circumstances. In support of this position respondents submit a summary of asserted facts with respect to 41 complaints filed on form BOp-105 which involved the services of the Chicago and North Western Transportation Company. (See page 172 of appendix A.)

Respondents contend that establishment of penalties would (a) divert essential revenue rather than foster the realization of funds now needed by railroads; (b) require the publication of a plethora of schedules based on low operating standards; and (c) stand as an obstacle in the way of progress toward a higher quality of rail service. The rail carrier respondents urge the Commission to authorize them, in an appropriate proceeding, to publish rates and charges that will produce revenues sufficient to enable them to acquire those facilities which they claim are so vital to improving service. Penalty procedures, they argue, will prove to be counterproductive.

The final statement submitted in this proceeding was by the Special Projects Staff of the Bureau of Enforcement and replies thereto were filed by respondent railroads, General Mills, Inc., and the Department of Transportation. This statement and replies thereto are also summarized in appendix A of this report.

DISCUSSION AND CONCLUSIONS

The record in this proceeding and the relevant portions of the record in Ex Parte Nos. 265 and 267 contain many facts, allegations, and arguments which give rise to a series of complex issues. The major questions presented, however, seem to fall into several general categories. It is believed, for example, that the specific proposals of shipper participants, the conflicting views and positions of respondents, and alternatives reasonably ancillary thereto may best be treated within terms of the following questions:

—Is the Commission statutorily empowered to inquire into the adequacy of railroad freight service?

—If so, what factors are primarily determinative of the quality or adequacy of that service?

—If freight service currently provided by the Nation's railroads is inadequate, what is fundamental to the effectuation of both short- and long-term improvements?

—What steps should the Commission take or what recommendations can be made to foster improvement in the general quality or adequacy of freight service provided by rail carriers?

JURISDICTION

The extent of the Commission's jurisdiction is limited to the power conferred upon it by the Congress in the form of the Interstate Commerce Act (49 U.S.C. §§ 1, *et seq.*) and related statutes. The jurisdictional question for determination is whether Congress has vested this agency with the power to regulate, control, or affect the quality and adequacy of rail freight service and, if so, to the extent to which remedial regulations may be promulgated.

Preliminarily, respondents generally admit that they had under the common law a responsibility to provide reasonably adequate service and that this duty is incorporated in the act. However, they maintain that certain asserted disclaimers of jurisdiction on the part of the Commission and certain decisions by the courts are decisive. Specifically, they rely on the decisions in *United States* v. *Pennsylvania R. R. Co., supra; Badger Lumber & Coal Co.* v. *Atchison, T. & S. F. Ry. Co., supra; Wells & Sons* v. *Chicago, B. & Q. R. Co.,* 161 I.C.C. 145 (1930); and *Adequacies—Passenger Service—Southern Pac. Co.,* 335 I.C.C. 415 (1969). It is respondents' contention that precedent establishes that the

Interstate Commerce Act does not confer upon the Commission the power to regulate, as a "practice," the operations of rail carriers.

These alleged jurisdictional defects cannot be currently reconciled with the regulatory responsibilities of this agency to foster adequate rail transportation service nor the present state of the law. The transportation problems which members of the shipping public have documented on this record should be reviewed in light of recent administrative and judicial constructions of several pertinent sections of the act. In *American Trucking Assns.* v. *Atchison T. & S. F. Ry.*, 387 U.S. 397 (1967), for example, it was asserted that jurisdiction was lacking and that the Commission could not properly consider certain questions relating to "piggyback" service. But in its decision on those questions the Supreme Court said, at page 410:

> [W]e agree that the Commission, faced with new developments or in light of reconsideration of the relevant facts and its mandate, may alter its past interpretation and overturn past administrative rules and practice. *** In fact *** this kind of flexibility and adaptability to changing needs and patterns of transportation is an essential part of the office of a regulatory agency. Regulatory agencies do not establish rules of conduct to last forever; they are supposed, within the limits of the law and of fair and prudent administration, to adapt their rules and practices to the Nation's needs in a volatile, changing economy. They are neither required nor supposed to regulate the present and the future within the inflexible limits of yesterday.

In considering the question of the Commission's power to inquire into and act upon the many grievances expressed by members of the shipping public with respect to the adequacy of rail freight service, it is useful to consider the decision of the Supreme Court in the *Pennsylvania* case, *supra*, upon which respondents so heavily rely. That case arose out of the Commission's report and order in *Pennsylvania Paraffine Works* v. *P. R. C. Co.*, 34 I.C.C. 179 (1915), a complaint action brought after a railroad had denied a shipper's request to increase the supply of tank car equipment available to it. Commenting upon the statutory duty of a railroad to have or furnish equipment the Court said, at page 227:

> *** The question is whether *** jurisdiction to enforce the duty was at common law in the courts or under the statute and in the Commission, and we have seen that it was the view of the Commission that the remedy was in the court ***.

Based upon this decision, respondents now argue that except with respect to those duties made subject to the Commission's regulation by other provisions of the statute, enforcement of the carriers' service duties rests with the courts. Specifically, respondents maintain that the foregoing decision established the precedent that the Commission is without jurisdiction to enforce the provisions of section 1(4) of the act which make it the duty of every common carrier to provide and furnish transportation upon reasonable request. There are, however, two major reasons why such a broad foreclosure of agency jurisdiction is not supported by the *Pennsylvania* case.

The question in the *Pennsylvania* case was not whether the Commission had authority to regulate the equipment of railroads or the adequacy of their services in general, but whether the Commission could, under section 1(4), require a carrier to buy or provide additional tank cars. Secondly, the legislative history of the Transportation Act of 1920 significantly altered the scope of the *Pennsylvania* case.

In 1916, during the height of a wartime car shortage, a special investigative committee of the AAR established to deal with the car service problem, found "that the observance of car service rules with respect to return equipment promptly to owners has in the past been to a great extent superseded by use or appropriation of cars by individual lines governed only by expedience." See *Car Supply Investigation, supra,* at page 702. Thereafter, and in consequence, Congress enacted the Esch Car Service Act of 1917 (40 Stat. 101) which was designed to "remove any doubt as to the power of the Commission"[5] in establishing reasonable rules, regulations, and practices with respect to car service by common carriers by rail. The jurisdiction of the Commission had then been invoked pursuant to section 1(15) of the act.

In addition to the indications discussed above with respect to the intent of Congress to have the Commission regulate both the quality and sufficiency of railroad freight service, the power to do so also is derived from the provisions of sections 1(10) and 1(21) of the act. As a matter of fact, respondents' position, resting mainly as it does upon the Supreme Court's decision in 1916 in the *Pennsylvania* case, is quite seriously weakened when it is set against the legislative history of the Transportation Act of 1920[6] in which the definition of "car

---

[5] H. Rep. No. 18, 65th Cong., 1st Sess., p. 6 (1917).

[6] In his remarks on the so-called Railroad Bill (H.R. 10453, 66th Cong. 1st Sess.) presented to the House of Representatives which had resolved itself into Committee of the Whole House on November 11, 1919, Congressman Esch of Wisconsin, Chairman of the Committee on Interstate and Foreign Commerce, said, in part:

(footnote continued on next page)

service" set forth in section 1(10) was amended to include the word "supply." It is evident that the addition of that word was for the sole purpose of extending the Commission's powers explicitly to include car supply and, quite obviously, the effect of car supply upon the adequacy of rail freight service. In section 1(21), moreover, which also was added to the act in 1920, the Commission is given the further implementing power to order a railroad "*** to provide itself with safe and adequate facilities for performing as a common carrier its car service as that term is used in this part."

The provisions of sections 13 (particularly section 13(2)) and 15 also confer extensive powers upon the Commission to investigate the practices of railroads and to prescribe practices to be followed by them in the future as, in its judgment will be just, fair, and reasonable.

Another major indicium of congressional intent on such matters, and probably the most illuminating of all is its formulation in 1940

(footnote 6 continued)

Then we have in title 2, practically in this same section, a very material amendment of the car-service act. The car-service act was passed about May, 1917, just too soon to become fully operative before Federal control began, so that the act has never had a fair chance of demonstrating its efficacy in the matter of car service. In the form in which we passed the act some two years ago, it related only to the exchange, interchange, and return of cars. We have enlarged that jurisdiction by saying that now the authority of the commission shall include the use—note the force of every word:

"The term car service in this act shall include the us [illegible] ontrol, supply, movement, distribution, exchange, interchange, and return of locomotives [illegible]

That was not in the old act *** cars and othe [illegible] s ***.

Which was not in the original act *** used in [illegible] ansportation of property."

Further, it gives the commission power as to the supply, movement, and operation of trains by any carrier by railroad subject to this act. If that authority had rested in the commission prior to Federal control, it might not have been necessary to have given to the President the great powers we gave him by the Federal control act. One of the commissioners stated that if the car-service act as now proposed to be amended had been in force prior to 1917, we might not have had to enact the Federal control act at all. This section relates to the use, control, and supply of cars and to the control and movement of trains. Under it the commission will have the right to order a carrier to supply itself with cars.

In a decision of the Supreme Court, known as the Tank-Car case (*United States v. Pennsylvania Railroad Co.*, 242 U.S. 208), decided, I think, three years ago, it was held that the commission in ordering the Pennsylvania Railroad Co. to supply itself with tank cars did not have such authority. I will ask the gentleman from Virginia (Mr. Moore) if that is not right?

MR. MOORE of Virginia. It was the tank-car case.

MR. ESCH. This section would give the commission power to order the carrier to supply itself with cars.

I hope, gentlemen, that these provisions, which seem so insignificant upon first reading, may be studied and weighed. **When** they are, I think you will begin to realize to what extent we have enlarged the scope and power of the Federal authority in the great matter of transportation.

58 Cong. Rec. 8309, 8315-16 (1919).

of the national transportation policy (54 Stat. 899). The Congress there expressly set forth the Federal regulatory scheme as it pertains to the transportation of commodities and passengers by carriers subject to the act. Declarative of the policy is the requirement imposed upon the Commission—

> *** to provide for fair and impartial regulation of all modes of transportation subject to the provisions of this Act, so administered as to recognize and preserve the inherent advantages of each ***; —all to the end of *developing, coordinating, and preserving a national transportation system* by water, highway, and rail, as well as other means, *adequate to meet the needs* of the commerce of the United States, of the Postal Service, and of the national defense. [Emphasis added.]

The "inherent advantages" provision is not repeated nor further discussed elsewhere in the act. Nevertheless, the Supreme Court has made clear that the provisions of the national transportation policy are to be implemented by the Commission to the same extent as other provisions of the act. See *American Commercial Lines, Inc.* v. *L. & N. R. Co.*, 392 U.S. 571 (1968); *Interstate Commerce Commission* v. *New York, N. H. & H.R. Co.*, 372 U.S. 744 (1963); *Schaffer Transportation Co.* v. *United States*, 355 U.S. 83 (1957); and *Dixie Carriers, Inc.* v. *United States*, 351 U.S. 56 (1956). It was in the *Schaffer* case, for example, that the Supreme Court, at page 83 of 355 U.S. characterized the national transportation policy as "the yardstick by which the correctness of the Commission's actions will be measured."

The full scope and implications of the national transportation policy are relatively clear. The Commission not only has the authority but the unmistakable duty to cope with change and to inquire into the operations and practices of all carriers of property subject to its regulatory process. This must be done with a view toward fostering the various means of interstate surface transportation in such a way as to provide for an efficient, effective national system.

It cannot be disputed that rail service is particularly suitable for the shipment of various types of commodities in long-haul movements. By the same token it can be argued successfully that there are varieties of goods which by their nature are especially conducive to transport by motor vehicle, water, and pipeline. And the validity of the Commission's taking a broader view of the scope of its powers on the basis of the intermodal concept of service was clearly recognized when the Supreme Court rejected, in *American Trucking Assns.* v. *Atchison T. & S. F. Ry., supra*, arguments by rail carriers that by requiring them to offer plan III trailer-on-flatcar (TOFC) service[7] to motor carriers, the Commission was acting outside the scope of its authority. The Court there reasoned that because the Nation's economy is constantly changing and volatile, there is room for novel regulatory practices within the congressional mandate governing the workings of the Commission.

Thus, charged as the agency is with responsibility for the full exercise of the powers delegated to it by the Congress, deterioration in the quantity and quality of service generally provided by one essential mode of transport is a matter within the statutory purview of the Commission. Further deterioration of such service would necessarily have a profound detrimental effect upon the operations of all modes of transportation, the business of shippers and receivers of freight and, ultimately, the viability of our entire national economy and defense. It is, therefore, proper and imperative that the powers expressed in the act be read in the sense that most freely tend to effectuate the national transportation policy and to safeguard the public interest in general.

The national transportation policy concludes by requiring that all provisions of the act be "administered and enforced with a view to carrying out the above declaration of policy." Inasmuch as the Congress has delegated to the Commission the enforcement and administrative responsibilities with regard to the statute, it is abundantly evident that congressional policy constitutes a source of jurisdiction for conducting this investigation into the adequacy of railroad freight service.

The RRRRA has already been mentioned hereinbefore. In a statement of purpose, it was noted that the aim of the legislation was to assist railroads to become financially stable "so that this mode of transportation could remain viable in the private sector, and continue to perform energy-efficient, ecologically compatible transportation services with greater efficiency, effectiveness and economy ***." This restatement of policy surely enforces the purpose of this investigation which in conjunction with the provisions of the RRRRA may lead to much better railroad transportation in the future.

In the absence of the simultaneous involvement of other provisions of the statute, the Commission often finds it necessary to refer complainants relying solely upon the provisions of section 1(4) to the courts for the relief they seek. See *Duralite Co., Inc.* v. *Erie Lackawanna Ry. Co.*, 339 I.C.C. 312 (1971). It is evident that in the circumstances of the instant investigation, however, additional sections of the act are involved. Those sections clarify respondents' duty to provide transportation and confer the responsibility to enforce that duty upon the Commission. Paragraphs (4) and (11) of section 1 provide, in pertinent part, that

---

[7] Plan III TOFC service embraces ramp-to-ramp rates based on a flat charge, regardless of the contents of trailers or containers, usually owned or leased by freight forwarders or shippers. No pickup or delivery is performed by the railroad involved. *Substituted Service—Piggyback*, 322 I.C.C. 301, 305.

> It shall be the duty of every common carrier subject to this part [part I of the act] to provide and furnish transportation upon reasonable request therefor, and to establish *** just and reasonable fares ***.

and that

> It shall be the duty of every carrier by railroad subject to this part to furnish safe and adequate car service and to establish, observe, and enforce just and reasonable rules, regulations, and practices with respect to car service; ***.

The provisions of section 1, subsections (4) and (11), of the act effectively codify the common law duty of railroads to provide adequate service. Compare *N. J. Steam Navigation Co.* v. *Merchants Bank*, 47 U.S. (16 How.) 344 (1848). Responsibility for the enforcement of these provisions, and, consequently, these duties, is placed directly upon the Commission by the provisions of sections 1, 12(1), 13, and 15 of the act. When a question arises as to service adequacy of efficiency, the practices of carriers cannot be ignored.

Section 12(1) provides the source of authority by which the Commission may inquire into the management of railroads, obtain information necessary to carry out the provisions of part I of the act, and formulate recommendations to the Congress. Inasmuch as this investigatory proceeding was instituted as a direct consequence of extensive shipper service complaints, the provisions of section 12(1) and (2) are relevant and support the conclusion that the Commission has ample jurisdiction herein. The Commission's responsibilities in the exercise of its powers "to prescribe just and reasonable rates" and to inquire into and report on the management of railroads necessarily must include the concomitant right to examine the practices of carriers to whose services the rates in question are to be applied.

Section 1(13) authorizes the Commission to require respondents to file their car service rules and regulations. That section empowers this agency, in its discretion, to direct that such rules and regulations be published in respondents' tariffs.

The provisions of section 1(14)(a) as amended by section 212 of the RRRRA of 1976, are designed to insure the maintenance of adequacy of the national freight car supply by giving the Commission authority to determine the compensation to be paid to owner railroads. Under this subsection of the act the Commission may consider those incentive elements of compensation which will encourage the efficient utilization of freight cars and the purchase, acquisition, and maintenance of a car supply adequate to meet the needs of commerce and the national defense.

Section 1(15) confers upon the agency summary and sweeping powers over the operations, facilities, and equipment of railroads whenever it is of the opinion that a "shortage of equipment, congestion of traffic, or other emergency requiring immediate action exists in any section of the country ***." If it is determined that such a crisis exists, the Commission's powers are so extensive that it can act at once upon its own initiative and do so without complaint, formal pleadings, hearing, or even notice to respondents.

The responsibility of railroads to provide transportation and the Commission's statutory jurisdiction over matters relating to their performance of that duty have been discussed in several of our earlier decisions dealing specifically with section 1(4) of the act. Two of those decisions in particular affirm the finding that the Commission possesses the requisite jurisidiction to regulate the practices of carriers to the extent that they affect the quality of rail freight service and consequently to conduct this investigation.

In *Brook-Rauch Mill & Elevator Co.* v. *St. L., I. M. & S. Ry. Co.*, 21 I.C.C. 651, 654 (1911), for example, it was said:

> We are of the opinion that the refusal by defendants to furnish a car for the outbound movement of the shipment in question amounted to a failure to furnish transportation as required by the provisions of section 1 of the act. It was their duty to furnish such transportation and as a part thereof to supply the necessary services in connection with the transfer in transit of the shipment. There can be no doubt that their refusal to do so was the occasion of annoyance and expense to complainant, and operated to its prejudice. In this view we do not doubt that complainant's petition presents a case within our jurisdiction.

In *Car Supply Investigation*, 42 I.C.C. 657 (1917), the Commission prescribed a set of car service rules after it found that the carriers' own car service rules were unlawful. It was there stated, at page 674:

> It is clear that the entry of a formal order is necessary to protect shippers, consignees, and the general public, but not less is it necessary to protect those carriers carriers which have sent foreign cars home in obedience to the direction at the hearing but which have not received their own cars from other lines. It would indeed be an anomaly if certain carriers could with impunity violate section 1 by failure to observe reasonable rules for the "exchange, interchange, and return of cars," and by so doing prevent other carriers from furnishing the transportation upon reasonable request which is required by the same section. ***

Upon consideration of the above-described legislative mandate and of past interpretations of the act and legislation supplementary thereto, the Commission is fully empowered and possesses the requisite jurisdiction to consider the issues here involved and to promulgate such remedies as may be deemed appropriate, reasonable, and necessary in the circumstances.

OBJECTIVES OF THIS PROCEEDING

Having concluded that the Commission possesses the requisite jurisdiction to conduct this investigation, the agency's responsibility herein extends considerably beyond the consideration of those proposals offered by the parties and enumerated earlier in this report.

The Commission is charged under the national transportation policy and the act to consider ways and means of establishing a basic strategy for dealing with ongoing problems in railroad freight service adequacy. The question in this respect is threefold: whether all factors involved in the broad range of services offered and provided by the Nation's railroads are practical from an economic standpoint; whether the services provided are efficient and responsive to the reasonable needs of shippers and receivers; and whether standards of performance can and should be prescribed for measuring the provision and quality of those services against the capabilities of carriers.

Additionally, the Commission must explore the possibility that an underlying reason for many of the asserted service failures is that service demands exceed both reasonable service needs and the capacity of respondents to provide them. It may well be, too, that the services actually provided are the product of opportunities, mistakenly taken, to operate contrary to the predominant characteristics of present-day railroading and commercial activity.

The Commission has observed that certain of its car service orders have been criticized for requiring the return of cars to owner roads. Moreover, in some instances, orders of that type can cause shipments to remain at origins while empty cars which could carry them to their various destinations are dispatched in the direction of owner roads because the Commission does not allow those cars to be diverted to provide service to the various other destinations. This problem is discussed subsequently.

Although the record fails to provide sufficient data to permit pinpointing all of the causes for deficiencies in carriers' service or the relative contributions made thereto by the practices of shippers, receivers, labor, and management, this report, nevertheless, must consider the need to adopt performance standards based upon sound principles of transportation.

THE MEANING OF ADEQUATE FREIGHT SERVICE

In order to consider objectively the adequacy of railroad freight service and various ways and means to influence its upgrading, there should be established at the outset a clear understanding of what adequate service is insofar as this proceeding is concerned. Freight service contemplates, of course, the movement of property. For the purposes of this proceeding, however, it embraces considerably more. According to their representations, shippers in general need adequate car supply and predictable, dependable, low-cost service in which their shipments are promptly dispatched and properly delivered to the parties to whom they are consigned, free of loss, damage, injury, or delay. Whenever any of these features are lacking in the basic service provided, still other factors, some of which are of an entirely different nature from the actual transportation of freight, must be taken into account in appraising the adequacy of service. Quality railroad freight service means more than the movement of property; how much more depends upon the point of view of the party making the judgment.

To sustain predictable, dependable, reasonably priced service to the fullest extent of its capacity, a railroad needs competent manpower; investment capital; and sufficient, well-maintained plant facilities and rolling stock. Its operations must be in consonance with shipper's reasonable needs and prevailing traffic lanes. It must achieve an efficient ratio of equipment utilization, and must have skilled, well-motivated management and fair return on investment. Whenever any of these factors are lacking, service quality and quantity will suffer. If, however, it is not the factor of managerial skill or motivation but some other element which is lacking in a given carrier's situation, the service may, from a purely performance point of view, be considered adequate under the circumstances even though shippers and receivers who use the service and pay for it would not so consider it.

The scope of service here under review and our assessment of quality or adequacy will be on a broader scale than that to which many respondents have addressed themselves. We shall first seek to identify what constitutes quality rail freight service in the broad sense and then evaluate the current level of service provided by the Nation's railroads.

ADEQUACY OF PRESENT SERVICE

During the last several decades there have been many significant changes of methods of manufacturing, marketing, distribution, and consumption in this country. With these facts in mind one might begin critically to examine what impact these changes have had and what they and others might forseeably have in the future upon both the traffic railroads traditionally have handled and their capacity and the progressiveness of the manner in which they have handled it. Growing public awareness and apprehension over the condition of railroads generally and the adequacy of the services they provide quite vividly point up the need for a continuing inquiry into this matter.

The time has passed when railroads provided the Nation with its only major source of intercity land transportation. Nevertheless, the Nation's railroads estimate that they still transport today approximately 40 percent of all such traffic. Because there is such a vast public need for and dependence upon railroad service, the need for this service to be fully responsive shows no real sign of diminishing. To the contrary, there is, in fact, a growing awareness that efficiency in the use of land, energy, and other resources requires increased attention to making rail service more attractive.

Respondents represent that the basic problem of service inadequacy is tied more closely than anything else to their need for increased earnings and their inability to obtain them. They aver that this bind as to earnings renders them unable to attract capital. The tasks of rehabilitating, modernizing, and carefully expanding railroad plant and physical facilities are difficult and costly. It is evident that there is a critical need for additional capital investment in railroads. See Ex Parte No. 270 (Sub-No. 4), *Investigation of Railroad Frt. Rate Structure—Coal,* 345 I.C.C. 71, 366.

In general, respondents argue that in order for service performance to be made more efficient, more cars and locomotives must be added to the fleet, the entire fleet must have an improved reliability, and the flow of freight must be maximized by keeping more locomotives and cars in motion. It is easy to agree in principle with that position. The communications and other systems described in respondents' representations are aimed, ultimately, at making available to rail management vital information with respect to the sources of traffic, cars, and motive power. The expenditures required for these improvements in plant, equipment, and systems coupled with inflation and the resultant increase in the cost of manpower and materials undoubtedly will continue to drive upward the direct operating costs and capital needs of the railroads. Respondents claim, however, that revenues must be allowed to expand so that their revenue-expense trends may be brought into proper balance. The substance of their position on service adequacy, then, is that with rising costs for plant, equipment, and manpower and without corresponding increases in revenues, they have been and most likely will continue to be unable completely to meet the public's demand for a higher level or quality of service. They argue that they have been severely hampered in their efforts to prepare for increases in service demands and they lay much of the blame for this situation on the doorstep of the Commission. They emphasize, too, that the limiting factor has been neither managerial motivation nor skill, but rather the necessary funds which would enable management to do what it knows must be done.

It is undeniable that lack of funds is a factor which creates service problems. Conversely, if railroads did have adequate funds, it would be most logical to assume that service would improve. However, the generation of increased revenues by increasing the general level of rates has not resulted in improved services or even in the improvement of the financial condition of marginal and bankrupt carriers. The RRRRA, mentioned previously, has provisions for financial assistance. This legislation has potential to aid in the resolution of many service problems. However, the nature and scope of the bill is not all encompassing; thus, its existence does not minimize the importance or necessity for this investigation. The general thrust of the bill is aimed at the Northeast, and the amounts provided are lower than the amounts estimated for full rehabilitation. The RRRRA was designed as an aid and not a cure-all; thus, both the carriers and this Commission must continue to

best copy available

work for means that will insure that the public's reasonable service needs are met.

Public uncertainty as to future levels of railroad rates and the viability of railroads generally as a mode of transport under private enterprise have caused shippers to seek alternative means of transportation and investors to turn away from railroad securities. If the future prospects for railroading are to be assured, more responsive service must first be established and maintained. Adequate service commensurate with real demands and capabilities will inevitably attract both traffic and capital. The Commission has not hampered the railroads in their efforts to raise capital. What has occurred is protection of the general public from unreasonable rates for inferior service. Certainly, it should be obvious to railroad management that general increases will not solve their financial problems.

The direction of traffic flow has always been particularly troublesome in conducting railroad operations. The bulk products of farms, forests, and mines, for which rail transport is well suited, give rise to a predominantly one-way movement into the populous consuming areas. Even certain of the less bulky products of factories (*e.g.*, auto parts programmed into assembly line schedules) require considerable one-way utilization of equipment. The acquisition of more special-purpose cars undoubtedly has interferred with the ability of railroads to balance the volumes and directions of the traffic they transport, and their capacity to meet the reasonable needs of many small shippers.

In the long run and for various reasons, railroads have lost to other modes of transportation considerable volumes of traffic. There are some opportunities now for recapturing that lost traffic. In order to do so, however, railroads must modernize their operations and develop their capabilities in such a way as to satisfy shipper needs. As they correctly point out, service is the only thing they have to sell to the public.

When a railroad is able to assemble a trainload of a single commodity, fewer delays are encountered, certain operating costs are reduced, and fewer cars are misrouted. Achievements such as these, when coupled with preventive maintenance, often tend to upgrade service quality from a shipper's standpoint. These factors tend to explain the emphasis placed by respondents in their representations upon unit trains, preblocking arrangements, and their efforts toward improved communications and maintenance. In many respects the assembly of unit trains is desirable. The factors of deteriorating rights-of-way and faltering maintenance programs, however, can easily offset the advantages so gained. Delays, breakdowns, and wrecks, for example, are more costly in terms of service adequacy if the trains involved in them consist of a large number of cars.

The process of stopping trains for further assembly or for a series of coupling and uncoupling cars, normal in railroading, consumes time and results in inefficient utilization of equipment and manpower. As the needs for terminal yard locomotives and additional train crews increase, costs rise, car utilization declines, and service capability and quality decrease. Similarly, the stopping of cars for partial loading or unloading or for trainsit privileges at intermediate points increases the opportunity for human error.

It must be remembered that expansion of the unit-train and preblocking concepts are only means to an end, adequate service. Unit trains have created new demands for capital in order to rehabilitate and, in some instances, to relocate yards, ramps, and other facilities. Inordinate delays in making up long unit trains, moreover, can defeat the speed with which rail service can respond to the public's needs.

Throughout this record there are conflicting views as to why inadequacies in service have arisen. Set forth in appendix A to this report is the parties' support of ways and means which are said to be available for correcting these inadequacies. Appendix B includes the various steps taken by the railroads to improve service.

Throughout the ensuing discussion, the report will refer repeatedly to the capacity of railroads to provide adequate service. At this point, then, the fact should be established that adequate service performance cannot be measured in terms of shippers' needs alone. Adequacy of service also involves two other factors—carrier capacity and performance. Service is not directly relatable to needs except to the extent that real capacity to meet them exists. If performance falls short of the capacity to meet reasonable needs, inadequate service is the consequence. Performance, however, can never exceed capacity no matter what the level of shippers' needs may be. The capacity to serve, moreover, when viewed in terms of a national system of railroads, is always going to be a matter of the lowest common denominator in the capacity of the system as a whole.

If the meaning of adequate rail freight service is to be established for the purposes of this proceeding and in general, then several factors must be taken into account. Capacity must be determined. There must then be an evaluation of performance levels in terms of that capacity. Reasonable but unfulfilled needs of the shipping public can then be considered to the extent that there is available capacity to fulfill them. There must also be some means to measure the degree to which full capacity is achieved through efficiency in performance. If adequate service is defined in terms of what shippers demand or what railroads provide, however, the exercise will be a futile one. Service adequacy can only be accurately defined in objective terms; hence, it can only be defined as that measure of service performance which bears a reasonably close relationship to the full capacity of railroads to fulfill all of the reasonable transportation needs of the shipping public.

MEASURES AVAILABLE FOR IMPROVING SERVICE

According to the initial representations filed herein by AAR, the supporting statements submitted by individual respondents, and the periodic reports summarized in appendix B, much progress has been made within the railroad industry in terms of improved communications, car control, operating efficiency, and preventive maintenance. Improved reporting systems and the exchange of computerized car movement data, signaling and operating procedures are proclaimed in the evidence. The efforts underlying the accomplishments thus far achieved and those still in the planning or implementation stages have been directed upward toward the goal of improving service quality. In order to make service as responsive as possible, there must be a coordinated effort to communicate more fully with the shipping public. Then a means must exist for measuring the adequacy of freight service performance against capacity and those changing needs of shippers which are within the capabilities of the railroads to fulfill. A way must be found to link supply levels more closely to shipper needs to detect inefficiencies in the underlying operations quickly and to correct such inefficiencies more thoroughly.

Development of sophisticated mechanisms by which railroads are able to operate more efficiently will prove useless unless management also recognizes more fully than it seems to have done in the past that the system of railroads is national in scope, that its primary function is to serve the public, and that a significant inadequacy in service in any part of the system affects the system as a whole to the detriment of all shippers and carriers alike. A viable transportation network must have at its foundation a sound plan for safeguarding the public's basic need for and entitlement to adequate service. Efforts in the allocation of resources in railroading will only prove to be effective if they are harmonious with that fundamental principle. Changes in railroad operations will be essentially meaningless if the basic and reasonable requirements of the shipping public, which are within the capabilities of the railroads to satisfy, are not met.

The provision of adequate freight service consists, in the broad sense, of currently meeting public needs and preparing to meet whatever those needs may become in the future. Future needs are often rather indistinct. That too explains why solving these related problems can only be accomplished through intense application by management of its collective skills. That will, in turn, assure an efficiency of operation, better equipment utilization, an improved return on investment, and a satisfied shipping public. Thus, in order to foster the restoration of service to an adequate level, and to maintain it at that level, the report will attempt to identify what alternatives exist and what ought to be done to stimulate the necessary collective effort.

The provision of service responsive to the public's reasonable needs (considering railroad management's profit motives and basic competence and their willingness to provide adequate service) depends largely upon management (1) having full knowledge of the nature and extent of the public's reasonable rail transportation requirements; (2) having sufficient locomotive power, cars, and other facilities necessary to perform the tasks the public needs to have performed; (3) establishing realistic service estimates in terms of capabilities; and (4) designing effective policies, procedures, and lines of communication.

The reasonable dispatch of loaded cars, the maintenance of and adherence to schedules for the provision of service, and the avoidance of delays, erratic deliveries, and the bunching of cars fall into another general category, because a relationship can and does exist among those elements. It can be said that reasonable dispatch, which also will be discussed in more detail later, *has no set meaning*. Quaker Oats Company and Southeastern Poultry and Egg Association, for example, propose that a 48-hour leeway be established as a standard for the arrival of cars at destination. Quaker Oats believes that any service which fails to meet such a standard less than 90 percent of the time should be considered unacceptable. The maintenance of schedules bears upon the question of reasonable dispatch from an evidentiary standpoint although failure to meet a schedule is not a failure to provide service with reasonable dispatch in all cases.

If terminal and switching delays and erratic deliveries could be avoided, that would help maintain scheduled services and aid in the provision of service with reasonable dispatch. But such delays are sometimes in the interest of a particular service. Failure to avoid such delays, therefore, is not in itself a failure to provide service with reasonable dispatch, and shippers would do well not to lose sight of this facts.

The prevention of claims was mentioned earlier and discussed in considerable detail in the Commission's report in *Loss and Damage Claims, supra.* Therefore, the effect of loss, damage, and delay upon the quality of service need not be re-examined here.

Accurate weighing and billing of shipments is a matter of considerable importance to all shippers and receivers. Although shippers of specific commodities such as scrap iron, grain, and other fungible commodities may presently have a keener interest in this aspect of railroad freight service than do others, accuracy is a matter of continuing concern to all shippers, receivers, and carriers. Attention also ought to be given to the need for information on specific shipments promptly to be provided to carriers so that they may forward such shipments as are tendered to them and render their bills for transportation charges.

The actual provision of service upon reasonable request is another problem which seems to be perennial. To some extent it can be explained, but not solved, by analyzing the shippers' concept of service as distinguished from that which is held by carriers. Generally, shippers claim to need a fast, reliable service with more emphasis on the latter than the former. On the other hand, the concept of service which is apparently held by many railroads is that adequate service means the provision of a level of service which will be acceptable and which can be provided at operating costs held to minimum.

In their pleadings respondents stress that they are customer-oriented; they say they always have been. They argue, nevertheless, that due to lack of funds, they have not been able to improve their condition or service. In our private enterprise system respondents have considerable latitude in choosing ways to improve their financial condition. And it would seem, certainly, that their opportunities for doing so between 1951 and 1970 were substantial. Despite these facts, as was pointed out at page 7 of the prior report, carload in-transit performance from 1966 through 1970 measured against standard in-transit times revealed that, except in the West where service was considered acceptable, on the average only 65 to 72 percent of all shipments were delivered on time.

Respondents' evidence reveals that the average distance a freight car moves each day is now approximately 56 miles. It thus appears that poor delivery-time performance is a result, the obvious cause of which is that many cars are standing still much of the time. The underlying reasons for this, of course, vary. Despite a declining car fleet, for example, larger cars and somewhat faster movement have accounted for a larger volume of traffic being handled by the Nation's railroads. According to records compiled by respondents, car-miles per serviceable day increased from 47.0 in 1957 to 56.1 in 1972. These figures tend to indicate that cars are in motion a greater part of the time, moving faster, or both. Net ton-miles per serviceable car, which reflect both average load per car and daily mileage, increased from 975 in 1957 to 1,472 in 1972. These figures demonstrate too that had not the Nation's railroads handled additional tonnage with fewer cars in recent years, the cost of operating a larger fleet would have had to be sustained by other means and their overall financial condition might well have been substantially worse than it is today. And the figures also raise the question of whether such improvement would have been realized had more cars been available or, to put it another way, would additional cars have contributed further to the congestion that was experienced.

Given the traffic volumes available and the opportunity to improve on such unimpressive rates of movement as approximately 56 miles per day per car, the fact that cars are in motion more now than before is noteworthy only when it is compared to the 47 miles per day achieved in 1957. Railroads, however, were not all that profitably or efficiently operated in 1957, and then, as today, there was concern over the national car supply problem.[8]

Respondents' asserted and real financial difficulties can best be solved in the short term by the expeditious transportation of freight. It is axiomatic that good service generally means good business. At the average rate of approximately 47 and 56 miles a day for each car, respectively 1957 or 1973, the lack of efficiency with which railroads perform their transportation function is apparent.

The railroad industry's traffic volume has not kept pace with this Nation's growth rate. This is in part attributable to the rail carriers' failure to meet shipper needs; for example, the great reduction of less-than-carload traffic and the great loss of higher rated traffic to other modes.

---

[8] See the 71st Annual Report of the Commission, pages 68-77.

Manufacturing shipments—U.S. census of transportation
(thousand of tons, millions of ton-miles)

	Railroad			Motor carrier			Private truck			Motor carrier and truck		
	1967	1972	Percent change	1967	1972	Percent change	1967	1972	Percent change	1967	1973	Percent change
Tons	436,437	433,717	(0.6)	34,101.2	416,611	22.2	179,788	246,035	36.8	520,800	662,646	27.2
Market share	45.6	39.6		35.6	38.0		18.8	22.4		54.4	60.4	
Ton-miles	241,442	229,853	(5.0)	86,611	107,208	23.8	26,586	33,912	27.6	113,197	141,120	24.7
Market share	68.1	62.0		24.4	28.9		7.5	9.1		31.9	38.0	
Average haul	553	530		254	257		148	138		217	213	

Freight rate index—August 1975

	Percent
Rail	175.6
Motor truckload	135.2
LTL	162.8
WPI	165.9
1969	100.0

Another indicium of the impact of failure of rail service to meet shipper needs is the evolution of excess capacity, which, at least partially, is caused by the diversion of traffic to motor and water carriers.

As can be seen from the following tables published in Transportation Facts and Trends, prepared by the Transportation Association of America, 10th Edition (Oct. 1973), the railroads have steadily lost their share of the market.

Intercity freight by modes (including mail and express)*
(Billions of ton-miles)

	Rail amount	Percent	Truck amount	Percent	Oil pipeline amount	Percent	Great Lakes amount	Percent	Rivers and canals amount	Percent	Air amount	Percent	Total
							**		**				
1939	339	62.3	53	9.7	56	10.3	76	14.0	20	3.7	01	.00	544
1940	379	61.3	62	10.0	59	9.5	96	15.5	22	3.6	.02	.00	618
1941	482	62.4	81	10.5	68	8.8	114	14.8	27	3.5	.02	.00	772
1942	645	69.5	60	6.5	75	8.1	122	13.1	26	2.8	.04	.00	928
1943	735	71.3	57	5.5	98	9.5	115	11.2	26	2.5	.05	.00	1,031
1944	747	68.7	58	5.3	133	12.2	119	10.9	31	2.8	.07	.01	1,088
1945	691	67.2	67	6.5	127	12.4	113	11.0	30	2.9	.09	.01	1,028
1946	602	66.6	82	9.1	96	10.6	96	10.6	28	3.1	.08	.01	904
1947	665	65.3	102	10.0	105	10.3	112	11.0	35	3.4	.11	.01	1,019
1948	647	61.9	116	11.1	120	11.5	119	11.4	43	4.1	.15	.01	1,045
1949	535	58.3	127	13.8	115	12.5	98	10.7	42	4.6	.20	.02	917
1950	597	56.2	173	16.3	129	12.1	112	10.5	52	4.9	.30	.03	1,063
1951	655	55.6	188	16.0	152	12.9	120	10.2	62	5.3	.34	.03	1,177
1952	623	54.4	195	17.0	158	13.8	105	9.2	64	5.6	.34	.03	1,145
1953	614	51.0	217	18.0	170	14.1	127	10.6	75	6.2	.37	.03	1,203
1954	557	49.6	213	19.0	179	15.9	91	8.1	83	7.4	.38	.03	1,123
1955	631	49.5	223	17.5	203	15.9	119	9.3	98	7.7	.49	.04	1,274
1956	656	48.4	249	18.4	230	17.0	111	8.2	109	8.0	.58	.04	1,356
1957	626	46.9	254	19.0	223	16.7	117	8.8	115	8.6	.68	.05	1,336
1958	559	46.0	256	21.1	211	17.4	80	6.6	109	9.0	.70	.05	1,216
1959	582	45.3	279	21.7	227	17.7	80	6.2	117	9.1	.80	.06	1,286
1960	579	44.1	285	21.8	229	17.4	99	7.5	121	9.2	.89	.07	1,314
1961	570	43.5	296	22.7	233	17.8	87(67)	6.6	123(84)	9.4	1.01	.08	1,310
1962	600	43.8	309	22.5	238	17.3	90(66)	6.6	133(90)	9.7	1.30	.09	1,371

Intercity freight by modes (including mail and express)*—Continued

	Rail amount	Percent	Truck amount	Percent	Oil pipeline amount	Percent	Great Lakes amount	Percent	Rivers and canals amount	Percent	Air amount	Percent	Total
							**		**				
1963--------	629	43.3	336	23.1	253	17.4	95(68)	6.5	139(94)	9.6	1.30	.09	1,453
1964--------	666	43.2	356	23.1	269	17.4	106(73)	6.9	144(102)	9.3	1.50	.10	1,543
1965--------	709	43.3	359	21.9	306	18.7	110(76)	6.7	152(110)	9.3	1.91	.12	1,638
1966--------	751	43.0	381	21.8	333	19.1	116(81)	6.6	164(117)	9.4	2.25	.13	1,747
1967--------	731	41.4	389	22.0	361	20.5	107(75)	6.1	174(128)	9.9	2.59	.15	1,765
1968--------	757	41.2	396	21.5	391	21.3	112(75)	6.1	179(139)	9.7	2.90	.16	1,838
1969--------	774#	40.8	404	21.3	411	21.7	115(83)	6.1	188(144)	9.9	3.20	.17	1,895
1970--------	771	39.7	412	21.3	431	22.3	114(79)	5.9	205(156)	10.6	3.40	.18	1,936
1971--------	746	38.2	445	22.8	444	22.7	105(70)	5.4	210(161)	10.7	3.50	.18	1,954
1972(p)----	783	38.4	470	22.6	475	22.7	109(73)	5.3	230(178)	11.2	3.66	.18	2,971

*Includes both for-hire and private carriers.

**See source data for figures in parenthesis, which are based on different reporting techniques.

#Effective 1969 no longer includes mail and express.

(p) TAA preliminary estimate.

TRANSPORTATION REVENUE VS. GENERAL PRICE TRENDS

(in cents)

Average revenue per ton-miles vs. wholesale prices@

Year	Rail (class 1)		Truck (class 1)		Air (domestic) (Schedules)		Oil pipeline		Wholesale prices	
	Revenue	Index	Revenue	Index	Revenue	Index	Revenue	Index	Index 1967 = 100	Index
1947	1.08	100	4.85	100	24.18	100	.292	100	76.5	100
1948	1.25	116	5.15	106	20.10	83	.299	102	82.8	108
1949	1.34	124	5.24	108	19.67	81	.310	106	78.7	103
1950	1.33	123	5.01	103	18.10	75	.315	108	81.8	107
1951	1.34	124	5.17	107	19.01	79	.320	110	91.1	119
1952	1.43	132	5.62	116	19.78	82	.328	112	88.6	116
1953	1.48	137	5.73	118	20.66	85	.322	110	87.4	114
1954	1.42	121	5.83	120	21.85	90	.319	109	87.6	115
1955	1.37	127	5.80	120	21.15	87	.322	110	87.8	115
1956	1.38	128	5.97	123	20.66	85	.317	109	90.7	119
1957	1.45	134	6.14	127	21.39	88	.313	107	93.3	122
1958	1.46	135	6.19	128	22.62	94	.318	109	94.6	124
1959	1.45	134	6.28	129	22.76	94	.314	108	94.8	124
1960	1.40	130	6.31	130	22.80	94	.315	108	94.9	124
1961	1.37	127	6.30	130	22.08	91	.315	108	94.5	124
1962	1.35	125	6.41	132	21.31	88	.320	110	94.8	124
1963	1.31	121	6.38	132	21.72	90	.318	109	94.5	124
1964	1.28	119	6.66	137	20.97	87	.304	104	94.7	124
1965	1.27	118	6.46	133	20.46	85	.279	96	96.6	126
1966	1.26	117	6.34	131	20.21	84	.269	92	99.8	130
1967	1.27	118	6.65	137	19.90	82	.259	90	100.0	131
1968	1.31	121	6.93	143	19.97	83	.257	88	102.5	134
1969	1.35	125	7.08	146	21.03#	87	.266	91	106.5	139

Average revenue per ton-miles vs. wholesale prices @—Continued

Year	Rail (class 1)		Truck (class 1)		Air (domestic) (Schedules)		Oil pipeline		Wholesale prices	
	Revenue	Index	Revenue	Index	Revenue	Index	Revenue	Index	Index 1967 = 100	Index
1970	1.43	132	7.46	154	21.91	91	.271	93	110.4	144
1971	1.59	147	7.85	162	22.58	93	.285	98	113.9	149
1972(p)	1.62	150	8.00	165	22.76	94	.295	101	119.1	156

**Includes Amtrak and Auto-Train, as will future years.

@See "Source Data" page for 1969-1964 average revenue per ton-mile for ICC-regulated barge lines.

#1969 revised to include Alaska and Hawaii as will all future years.

(p) TAA preliminary estimate.

It might be argued that the current poor capital position of the railroads is the main causative factor. This is merely a circular argument. If the railroads provided an extremely attractive service, they would have experienced a growth rate which would at least be related to the national growth rate, resulting in an improved capital position. However, the solution is not be found looking backward, rather the rail carriers, the Government, and the shipping public must start planning long-term solutions now.

In the final analysis, the basic question is: Can existing rail freight service capacity be made more responsive to fulfill shippers' reasonable needs? All who are concerned with rail service need to acquire and organize an incredible amount of knowledge about a myriad of technical and other problems in order to answer that question. Railroad management and members of the shipping public might have to be goaded from time to time to put forth the necessary effort to do so. Nevertheless, the question can be answered affirmatively.

One of the root causes for the disparity that now exists between reasonable service needs and the fulfillment of them is the failure, in many instances, to consider all operating alternatives (as opposed to the summary cancellation of specific services) which will satisfy both the profit objectives of a privately owned railroad system engaged in a competitive transportation market and the service requirements of the shipping public which conducts its affairs in a competitive marketplace.

As capabiliity and reliability in service are more precisely determined and restored, revenue and/or rates of return on investment should rise. Improved service quality has the potential for generating levels of revenue far in excess of those sought in some of the rate proposals of recent years. The relative ineffectiveness to date of current methods for holding railroads and members of the shipping public accountable for delays to shipments in transit and the detention of revenue-producing equipment presents perplexing problems. Clearly, these matters call for exertion of more control in the public interest because they relate so closely to the current inadequacy problem. However, increased levels of revenue, coupled with the fact that railroads earn them through improved service and operating controls rather than reliance on attempts to match rate increases to increases in costs, could generate such interest in the financial sector that additional private capital for financing other improvements should be forthcoming. The Commission observed in Ex Parte Nos. 265 and 267, 339 I.C.C. at 180:

> The funds which the respondents might reasonably be said to need to accomplish various improvements in their plant, and consequent ability to provide service, are not necessarily to be obtained directly from increases in the rates and charges paid by the shipping public.***

Furthermore, actual needs for capital outlays could be somewhat reduced. Based upon this conviction, it appears that two aspects of the overall service adequacy problem deserve the closest scrutiny. They are: (1) requiring railroads to publish service schedules in order to establish predictable service, and (2) re-evaluating existing practices of railroads and the shipping public, especially as they relate to equipment supply and utilization.

The availability of published schedules would enable a shipper to inform itself, on the basis of its own real needs, of the announced capability of a given railroad or all railroads in a given routing. Realistically modifying current demurrage rules also would seem to hold out the promise of eliminating needless equipment delays and shortening the turnaround time now required for cars. Improving equipment investment and utilization ratios would seem to depend heavily on such matters. If these matters were corrected, additional investment by shippers in their own cars also would be encouraged, thereby further improving car supply.

Thus, by acting to foster greater utilization of the existing car fleet and to expedite the return of shipper-owned cars, the Commission and others can improve the potential for service quality and, in time, enlarge it immensely while reducing the cost.

What is needed is a plan that can be executed without delay and without susbstantial capital outlays. Having a plan would enable railroads collectively to tap additional sources of available tonnage presently foreclosed to them because of the poor quality of their present service.

As utilization is improved and tonnage and revenues increase, unit costs may be reduced and additional net earnings realized by the distribution of costs over a broader revenue base. In turn, this would increase both the opportunity for and the likelihood of not only a more profitable operation overall but also, on the basis of improved net earnings, an increased attractiveness to investment capital of the Nation's railroad system.

SERVICE SCHEDULES

One of the major complaints of the shippers in this proceeding is the failure of the railroads to consistently perform on time. For example, General Mills noted that according to its records of rail service, based on an arrival target of a 3-day span plus normal switching and on-route transit times between 1964 and 1966, railroad shipments arrived "on time" only 65 to 72 percent of the time. The "on time" arrival frequency declined to 66 percent from 1966 to 1970, and to 65 percent in 1971. The Glass Container Manufacturers Institute, Inc., conducted a 3-month study in 1968. From this study it concluded that actual transit-car days exceeded normal transit-car days by an average of 59 percent. The excess transit-car days contributed greatly to bunching at destinations. A study conducted by Procter and Gamble Co. during the month of December 1971, showed that approximately 46 percent of the total of 2,733 carload shipments exceeded the "normal transit time" by 1 day or more, and about 10.6 percent arrived at destination 5 or more days over the standard. The normal transit time for Procter and Gamble varies greatly but is considered quite lenient. For example, it allows 22 days for a movement from Sacramento, Calif., to Boonton, N.J. Other shippers and receivers related similar complaints regarding excessive transit time.

To alleviate the uncertainty in the service the shippers requested that the railroads be required to publish service schedules other than those referred to in the *Official Guide of the Railways*. The record contains little elaboration on the style of such schedules. Several shippers did suggest that dock-to-dock schedules be required. They state that schedules would establish some criteria by which railroads could be held accountable for the conduct of operations which fail to produce adequate service.

Respondents, in reply, objected to the imposition of any schedule publication requirements. They claim that such a requirement would be extremely difficult and expensive, with several estimations of the number of schedules needed to meet the suggestion running into the trillions. They claim that such a requirement in addition to being extremely difficult would be exceedingly expensive. They further state that they need wide operating latitude to protect themselves against the many unpredictable events they encounter.

Although the Coordinator finds some merit in the arguments advanced by shipper interest with the publication of schedules and is sympathetic to their plight, the record simply will not support the imposition of a requirement to publish schedules. Such a regulation would be unduly burdensome and costly. Point-to-point schedules for all possible comparisons of origins and destinations have not been shown to be essential or realistic. If publication of service schedules were to be made mandatory, the publication would have to be in tariff form. See *Ad Hoc Committee on Prs.* v. *United States,* 317 F. Supp. 370 (1970). However, the publication of service schedules would expose the railroads to potential civil liability that could conceivably run into millions of dollars for damage claims based on the failure to meet published standards. Further, the publication of service schedules and the failure to conform in all instances to those schedules might result in railroads being fined from $1,000 to $20,000 for each failure as the Elkins Act, 49 U.S.C. 41(1), states: "The willful failure upon the part of any carrier subect to said Acts *** strictly to observe such tariffs until changed according to law, shall be a misdemeanor ***." The railroads cannot afford the additional drains on their financial resources that publication of schedules would entail.

The above findings are not meant to infer that the shippers are not entitled to reasonably good service. There is a need for the shipper to know how long the movement of freight will take. The need has increased recently due to the high cost of capital, inflation, and other economic considerations which have lead shippers to carry the smallest possible inventory to meet their demands. Transportation has become part of the manufacturing distribution process. The frequency of carrier failure to dependably transport goods seriously impairs the manufacturing marketing processes. Part of the carriers marketing technique requires indications to the public they serve of what can reasonably be expected. For example, the respondent already publishes selected timetables in the *Official Guide of the Railways.* Additionally, they publish routing instructions in many of their tariffs.[9] Furthermore, a reading of respondent's representations herein and the quarterly reports reveals that they frequently admit to having schedules. The existence of schedules can do nothing but aid the effectiveness and safety of their operations. The need for specific service parameters leads many to suggest that the carriers publish schedules between major terminals in the *Official Guide of the Railways* or other publication generally consulted by shippers. Such schedules should present no real difficulty in preparation. The time requirements can be denominated in terms of the number of days or portions thereof, *e.g.,* train will depart Chicago, Ill., arriving at Denver morning of second day. Typical examples of such schedules now appear in tables 1 through 12, pages 72-75; tables 1 through 15, pages 129-131; then at page 165 of the March-April 1975 issue of *Official Guide of the Railways*. A selected number of these tables are reproduced in appendix C to this report and are taken from the schedules established by the Chessie System, the Burlington Northern Railroad, and the Chicago, Rock Island and Pacific Railroad. Guidelines which may be utilized in the preparation of such schedules are also presented in appendix C. The carriers are encouraged to voluntarily publish service schedules and most importantly to adhere to the schedules. Certainly, the publication of service schedules will aid the carriers in their solicitation efforts to generate new or additional traffic.

---

[9] For example, see section 5 (Routing Restrictions) in Westbound Commodities Tariff published by the Trans-Continental Freight Bureau, I.C.C. No. 1789.

The issue of schedules has been resolved in favor of requesting rather than requiring their publication because the Coordinator firmly believes that respondents should be afforded the opportunity to establish their own timeframes. Schedules should be based upon the carriers records and their bona fide assessment of their current responsibility and reasonable shipper needs. Furthermore, the potential impact and ramifications of the RRRRA would so alter service responsibilities as to render any pressurized schedules unrealistic.

The voluntary publication of service schedules may have the effect of allowing coordination of operating schedules between railroads which could lead to a more efficient and unified national rail system. This coordination could also allow redundant rail capacity to be more precisely identified, and ultimately eliminated. Eventually the publication of schedules could lead to the establishment of a better quality of service to the general shipping public.

EMPTY CAR MOVEMENTS

A concomitant to the scheduling of traffic is the availability of empty cars. The provisions of section 211[10] and 212[11] of RRRRA and Ex Parte No. 241, *Investigation of Adequacy of Freight Car Ownership,* 335 I.C.C. 264 (1969), would render any request for the publication of schedules of empty car movements unnecessary at this time. The Ex Parte No. 241, *supra,* prescribed car service rules to be observed by the railroads in the movement, interchange, and utilization of freight cars. The railroads were also required to collect data on car distribution, utilization, and shortages and report annually to the Commission including description of the steps taken to cure deficiencies pursuant to a car-ownership formula.

---

[10] Section 211: "Demurrage charges shall be computed, and rules and regulations relating to such charges shall be established, in such a manner as to fulfill the national needs with respect to (a) freight car utilization and distribution, and (b) maintenance of an adequate freight car supply available for transportation of property."

[11] Section 212 states that it is the intent of Congress to encourage the purchase, acquisition, and efficient utilization of freight cars and that in order to carry out that intent, the Commission may set the compensation to be paid for such cars and the other terms of the contracts for the use of such cars. The Commission is required, at least once every 2 years, to determine the rate of compensation to be paid for the use of each type of freight car owned or controlled by a railroad. Such compensation is to be fixed on the basis of all elements of ownership expense including a fair return on the cost of each type of car. The Commission is directed within 18 months after the date of enactment to revise its rules with respect to car service, in accordance with this provision.

The Commission has continued to monitor the adequacy of the freight car supply and in June of 1974 issued a report and show cause order in this proceeding 346 I.C.C. 497 requiring the class I railroads to show cause why they should not be required to purchase additional equipment to rectify the report deficiencies and to reduce the bad-order ratio on all types of cars in the then-current fleet to 5 percent. The 1974 report did not alter the car service rules previously adopted, 335 I.C.C. 874.

Additionally, the AAR programs, discussed elsewhere herein, have the potential of facilitating prompt service responses. It would appear unnecessary for the Commission to require the railroads to duplicate the Train II and other AAR programs.

Currently car service orders are issued in response to problems regarding the unavailability of empty cars for timely placement. This remedy is limited to responding to existent problems. To facilitate the initiation of preventitive action the Commission has sought revision of section 1(15) of the act. The requested revision would permit the suspension of any or all rules regarding car service for a period of time; issue car service directives in the public interest, not just in emergency situations; and give directions regarding perference or priority in transportation, embargoes, or movement of traffic. The major advantage to be gained by passage of the proposed legislation is that the Commission could respond more rapidly or even act prior to an emergency.

REASONABLE DISPATCH

Manufacturing Chemists Association and certain other nonrailroad interests urge the Commission to define reasonable dispatch in this proceeding. Monsanto Company, for example, suggests that the term be defined and that substantial and accelerating penalties be levied against railroads for failure to transport property with reasonable dispatch.

It seems that certain participants presuppose that reasonable dispatch in transportation is susceptible to slide rule calculation and that imposition of penalties will induce compliance with the resulting formula. This is tantamount to formulating schedules for all movements and imposing penalties for failure to meet such schedules.

Formulating an all-encompassing legal definition of the term and making it applicable to shipments of general freight transported by respondents would be, at the very least, difficult. For example, determining what is a reasonable time for transportation depends upon properly establishing what is a reasonable time at different times of the year, what is a reasonable time for certain commodities as compared to others, and what is a reasonable time for the distance involved and the routing chosen or otherwise available in a given transportation pattern.

A shipper's entitlement to damages for the failure of a carrier to transport property with reasonable dispatch would not be easy to determine. The final outcome before a court would be affected not only by the time interval involved, but also by such things as the customary time for such a movement, seasonally adjusted; various other elements of proof; and calculating damages on such things as the loss of a sale, a reduction in the value of the goods shipped, or the loss of production in a business. Additionally, a shipper must prove that his loss resulted from the negligent delay of the carrier. On the other hand, once that burden has been met by the shipper, the carrier, if it is to be exonerated from the claim, has the duty of proving the applicability of one of the accepted defenses (usually an act of the shipper, the public enemy, the inherent nature of the property involved, or an act of God).

There is precedent, of course, for shippers' proposal. See Ex Parte No. MC-19 (Sub-No. 8), *Practices of Motor Common Carriers of Household Goods*, 111 M.C.C. 427 (1970). Although the rail mode of transport was not a party to that proceeding, the Commission did undertake to define to a limited extent the term "reasonable dispatch." In recognition of the public need "to urge the (household goods) carrier and the shipper to disclose fully their respective problems *** and to agree on dates or periods of time within which the transportation service required is to be performed ***," the Commission established a new rule (subject to the defense of force majeure) which reads as follows:

> The term reasonable dispatch means the performance of transportation on the dates or during the period of time agreed upon by the carrier and the shipper and shown on the order for service *** and recorded on the bill of lading ***.[12]

Losses of sales, reductions in the value of goods shipped, and losses of production are seldom, if ever, involved in the transportation of personal effects used or to be used in a dwelling. Contrary to the suggestion of shippers herein, the Commission was not directly concerned in the above proceeding with the assessment of liquidated damages. Rather, it was concerned with compliance by carriers with the commitments they made to their prospective customers when soliciting shipments. The definition of reasonable dispatch there adopted is not encumbered with the various penalties or circumstances of transportation that are reflected or implied in shippers' position in this proceeding. The customer's recourse, should the goods not be shipped with reasonable dispatch, may be to the Commission but only on an informal basis. If this is not successful in resolving the claim, the customer's recourse is to a court of proper jurisdiction.

A proceeding addressed specifically to the matter of the need to define reasonable dispatch (including the applicability thereof to certain rail movements) in the transportation of perishable commodities presently is pending before the Commission. Ex Parte No. 284, Investigation into the Need for Defining Reasonable Dispatch (Perishable Commodities). Undoubtedly, the Commission will have before it in that proceeding similar substantive arguments as are reflected in this record and will take appropriate action with respect to them insofar as they may be applicable to the transportation of perishable commodities by all modes of transport.

A decision on whether or not to institute a proceeding to define "reasonable dispatch," insofar as it pertains to rail transportation of freight other than perishable commodities, must of necessity await the Commission's final decision in Ex Parte No. 284. Constructive steps to improve service and, in particular, to decrease the time necessary to transport freight from origin to destination, as indicated by the following discussion of "Terminal Operations," are not foreclosed by the conclusion not to institute the rulemaking proceeding at this time.

---

[12] 49 CFR 1056.1(c).

Terminal Operations

Archer Daniels Midland Company, Construction Aggregate Rail Shipper Conference, Far-Mar-Co., Inc., Georgia-Pacific Corporation, and the National Grain & Feed Association urge the Commission to study service problems that arise from in-terminal delays and respondents' current switching and interchange procedures. The grain interests further suggest that rather than compel respondents to initiate and maintain strict freight schedules, the Commission should endeavor to resolve these less complex problems because they appear to underlie the more significant inefficiencies in overall operations. It should be noted that some service improvements have been made by railroads. Predominantly, those improvements have been in the areas of line-haul operations, not in terminal operations. According to respondents' representations and quarterly reports, other service improvements are being planned and will, in time, be implemented. Emphasis must be given to terminal operations. It is understandable that shippers would specifically question the efficiency of this aspect of railroad operations and the part it plays in the quality of total service.

A study of BOp 105 complaints filed from November 5, 1971, to September 15, 1972, indicate that 45 percent of the complaints were related to unfit cars, 44 percent to delays, 8 percent to car shortages, and 3 percent to miscellaneous. An AAR study dealing with car utilization, which is designated report CU 1.1005 and was published July 4, 1974, contained the following table:

Composite car cycle average times

	Total car days	Days per cycle	Percent
Consignor time	11,700	3.85	15.0
Loaded railroad terminal time	22,300	7.34	28.7
Loaded railroad line-haul time	6,200	2.03	7.9
Consignee time	9,800	3.22	12.6
Empty railroad terminal time	22,700	7.48	29.2
Empty railroad line-haul time	5,200	1.70	6.6
Total cycle time	77,900	25.62	100.0

According to this information, the average car cycle time was 25.62 days, of which 14.82 days were spent either loaded or empty in terminal areas. This terminal time is equivalent to 57.9 percent of the total car cycle. From this information it can easily be seen why considerable emphasis must be placed on terminal operations and the development of methods by which these operations might be improved and speeded up. Delays in terminals are one of the causes of inadequate rail service and certainly an area which must be considered carefully if rail service is to be improved.

A recent study conducted by M.I.T. regarding railroad operations and economics[13] contains much pertinent data regarding terminal operations. In general, it was determined that the efficient operation of large terminal yards required a significant spread of time between inbound and outbound train demands. Efficiency could be accomplished by scheduling train movements, so as to avoid peaks in demands placed upon yard resources, however, it was apparent that these peaks are not being avoided as it was determined that a substantial number of cars missed normal connections at the yards studied. The percentage of loaded cars which missed normal connections ranged from 25-31 percent. The percentage of empty cars which missed normal connections ranged from 34-68 percent.

There are three major factors which determine how long a train takes to pass through a yard, and consequently whether or not it makes a normal connection. These factors are: the arrival time of a train, the train's consist, and the time of outbound departure. There is a direct causal relationship between the time available to make a connection and the probability of successful connection. Therefore, if a train arrives early it has a good chance of making a normal connection; if it arrives late it has a good chance of missing a normal connection. Perishable traffic is given priority in the yard, and, therefore, has a significantly lower average yard time resulting in better than average connection possibilities. Cancellation of outbound trains was the cause of missed normal connections for 20-30 percent of the cars which did miss their normal connections.

A high percentage of empties which missed their outbound train did so, in part, because the empties had no specific destination when they entered the yard. Thus, most empties merely sat in a yard until instructions were received or enough cars were gathered to run a train of empties to a particular destination.

The studies revealed that loaded cars moved predominantly eastbound, while empty cars moved predominantly westbound.

---

[13] Studies in Railroad Operations & Economics; Vol. No. 4, The Impact of Classification Yard Performance on Rail Time Trip Reliability; Vol. No. 6, Some Analyses of Railroad Data.

However, regardless of the direction of the cars, there was substantial movement unreliability existent through terminals.

An example of one railroad's interest in terminal improvement is the Burlington Northern which claims to have achieved some success in improving its service performance through the refinement of its terminal performance controls. Although, like other railroads, it opposes the prescription of mandatory service standards and sanctions, because it believes that the resulting costs would force rates upward, it says that these refinements are predicated upon analyses it has made of exceptions to standard schedule performance times. This type of activity is clearly in the right direction, but also quite clearly not enough.

There have been studies and proposals involving methods which could resolve some of the problems now encountered in rail terminals. These activities have ranged from proposals for Federal Government aid to the rail industry for solving terminal problems, to action by the rail industry alone regarding the consolidation of facilities. Two projects which could have a profound effect upon terminal operations are: (1) the establishment of the Train II computer information system, and (2) the St. Louis terminal consolidation project.

Train II has been in effect since June 15, 1975. It is basically an information system whose major goal is to improve car utilization. The potential effect of the system upon terminal operations is obvious once one realizes that terminal delays result in poor car utilization. Train II may be utilized to improve terminal operations in several ways. One way is in developing advance information on line which can be utilized to provide better advance scheduling in terminal areas. Thus, when a freight train is due to arrive at a terminal, the terminal operators will know in advance how many cars are arriving, where they are destined, and what resources must be allocated to quickly clear the arriving cars through the terminal. However, this system will work only if some physical improvements are made with regard to terminal facilities.

Federal aid in maintaining and rehabilitating terminal facilities may be in the offing such as the provisions of RRRRA. There is one project presently being conducted by the railroad industry, with the aid and assistance of the Federal Railroad Administration, which is also of great interest. This project is the consolidation of the terminal facilities in St. Louis, Mo. The purpose of the project is to establish a methodology whereby the St. Louis terminal can be made more efficient. If the railroads involved reach agreement on the consolidation of terminal facilities and the future operation of the terminal area, and if sufficient funds can be allocated to carry out the plans, this project could be the blueprint for future terminal consolidations. At the present time we are informed that the project is still in the planning stages, and, thus, no conclusions can be drawn as to the particulars of the proposed consolidation.

It should be noted that both the industry and the Congress are working separately and together to help solve the problems related to terminals. The Commission is also aware of the importance of this area and the Coordinator will recommend steps he deems advisable in attempting to solve the terminal problem. Unfortunately, the parties to this proceeding have not placed in evidence sufficient information to allow the development of proposed rules affecting the various phases or components of railroad terminal operations. Consequently, the Commission at this juncture must be concerned mainly with patterns. Attempting to find solutions to various specific problems encountered in providing or using railroad freight services could easily lead to precipitate action if a framework for approaching the problem were not first established.

In this report considerations involving terminal operations or interchange procedures as they apply to overall service have been considered. What needs to be done now is to establish the mechanism for establishing minimal capability standards against which current levels of service performance can be measured.

The importance of efficient terminal operations to the adequacy of total service is manifest. It is not one of those problems, however, that can be cured without specific inquiry. Undertaking such a study would require that data first be gathered on the current capacity of all major terminals and many terminals of lesser importance. In *Propriety of Operating Practices—Terminal Services*, 209 I.C.C. 11 (1935), for example, the Commission examined terminal practices in which railroads and industry then engaged. Hearings were conducted throughout the country. Determining whether and to what extent such practices still exist, or how they may have grown larger or more complex would require substantial preparation before a similar study might be undertaken today.

The data needs of the Commission with respect to the ingredients of service are substantial. Unfortunately, as mentioned above, the requisite data was not placed in evidence. In order to make precise determinations, such data should include, for example, the geographical location and capacity of all terminal facilities. They also would have to include information on rights-of-way, bridges, structures, and tunnels; the number, location, and capacity of scales and shops; the capacity of tracks and yards (including auxiliary yards), stations, ramps, junctions, piers, and wharves; the number and distribution of freight cars of various types and line-haul and switching locomotives; the speeds of various trains; and the number, distribution, and classification of personnel.

This does not mean that the Commission should delay in establishing a rulemaking proceeding with regard to standards which will pertain to terminal service in general. Sufficient information exists in the present record which will enable a general terminal service formula to be developed. This formula should be the subject of a rulemaking proceeding during which the formula may be modified should the evidence presented so warrant. The proposed rules for this proceeding are contained in appendix E of this report.

The institution of this rulemaking proceeding is essential, and the enactment of RRRRA will only increase the potential success of the proposed rulemaking. It is reasonable to expect the railroads to respond to a rulemaking proceeding regarding terminals since they have knowledge of the scope of their own financial resources. Implementation of such a proceeding regarding the proposed rules contained in appendix G will not be dependent upon joint governmental efforts to insure financing which all estimates place in the billions of dollars.

The Commission in Finance Docket No. 25864, *Erie Lackawanna Railway Company* v. *Penn Central Company* (not printed), ordered the study of interchange traffic at the Maybrook, N.Y., terminal so as to determine the merits of a complaint filed by Erie Lackawanna. The study was conducted by the Erie Lackawanna and Penn Central under the supervision of an arbitrator. After the study results were compiled and reviewed, it was determined that the reason for the great number of missed connections at the Maybrook yard was inadequate time allotted for processing cars through the yard. This result is in full agreement with the finding of the M.I.T. study and indicates a possible solution to terminal problems involving interchange traffic.

A series of studies similar to the Maybrook study should be initiated at major terminals throughout the Nation. The procedures followed could be the same as those used in the Maybrook study. See appendix F. These studies would assist the establishment of terminal schedules whereby adequate time allotment can be provided for passage through the terminal. This will result in fewer missed interchange connections in terminals where the major cause of delay is inadequate time scheduling. The study should also indicate terminals where delays are the result of late arrivals and/or cancellation of departing trains. In general, these studies could provide information to be used in improving rail terminal service. These studies, of course, will be concerned with interchange of railcars, not with origination or termination of cars. The performance standards recommended in appendix E are directed to overcome inordinate delays at origin and destination as well as terminal interchange points. It is the Coordinator's recommendaton that the Commission require the railroads to conduct such studies. These studies will be complementary to the suggested rulemaking and would assist the carriers to resolve terminal problems.

FREIGHT CAR ADEQUACY

If a railroad does not maintain an adequate supply of freight cars it simply cannot provide adequate service to the shipping public. Despite this fact, freight car ownership for class I railroads between the years 1951 and 1969 declined from 1,777,878 cars to 1,464,194 cars. In Ex Parte No. 241, *Investigation of Adequacy of Freight Car Ownership*, 335 I.C.C. 264, studies were conducted regarding the adequacy of freight cars, for the respresentative months of May 1970, October 1970, and October 1972. A subsequent study for the month of October 1973 indicated that the class I railroads had total deficiencies in serviceable freight car ownership of 198,067 cars. Therefore, it is reasonable to conclude that the reduction in freight car ownership indeed has resulted in freight car deficiencies, adversely affecting service. This problem has been the subject of numerous investigations by the Commission beginning with *Car Shortage—Insufficient Transportation Facilities*, 12 I.C.C. 561 (1907), and continuing to the present with the recent show cause order issued in Ex Parte No. 241, 346 I.C.C. 497 (1974), and the recent modification of incentive freight car per diem regulations initially promulgated in Ex Parte No. 252 (Sub-No. 1),*Incentive Per Diem Charges—1968*, 337 I.C.C. 183.

When a shipper calls upon a railroad to transport its product, and the railroad cannot provide the equipment necessary, that business may be lost to the railroads, perhaps permanently. Shippers having other transportation choices may divert the traffic. If the traffic shifts to a higher cost mode with no offsetting advantage the cost added will probably be passed on to the consumer. Shippers bound to rail service simply bear the inconvenience or cost of the delays.

In Ex Parte No. 241 the Commission determined that it was necessary to exercise its authority to require rail carriers to acquire additional equipment to fulfill their responsibilities as common carriers. This authority is dervied from section 1, subsections (10) and(21) of the act. The Commission's decision was based upon numerous factors, the predominant one being that studies showed that the Nation's railroads had failed to provide themselves with an adequate supply of freight cars, and, in fact, as mentioned above, the number of freight cars owned had declined over the past few decades. This decline in freight car ownership was somewhat offset by the development of larger cars and a somewhat improved car utilization. However, the increased utilization and greater carrying capacity did not fully offset the decline in ownership, resulting in serious freight car shortages. Additionally, larger freight cars carry a disadvantage which may more than offset whatever advantage greater carrying capacity may afford the railroads. This disadvantage is the additional wear and tear caused by the larger freight cars upon the track over which the cars run. Track maintenance is a problem which the railroads apparently do not have the financial resources to resolve. Any additional track deterioration incurred by larger freight cars will serve only to exacerbate the problem, thus limiting the benefits larger cars were designed to provide. The economic downturn reversed the car shortage situation; however the downturn is not expected to continue and the shortage problem is expected to recur in the near future.

To alleviate car shortages, the Commission entered an order "requiring those class I railroads who have failed to equip themselves with an adequate supply of freight cars to purchase additional rolling stock in an amount equivalent to the average deficiency in general purpose freight cars recorded for the years 1970 to 1972." Ex Parte No. 241, *supra*, p. 503. It would be unrealistic and uneconomical to require the railroads to maintain car fleets sufficient to meet all peak periods or other unusual demands. Their purchases were allowed to be spread over a 2-year period from the time a final order is entered in Ex Parte No. 241. As of this time, numerous show cause statements have been received and are being evaluated, hence, a final order has not yet been issued. However, perhaps in response to this order, in 1973 the railroads ordered 106,077 new and rebuilt cars, the highest number since 1956.

One method of encouraging the more efficient utilization of boxcars has been the imposition by the Commission of incentive per diem charges. As explained in Ex Parte No. 252 (Sub-No. 1), *Incentive Per Diem Charges—1968*, 349 I.C.C. 303, the purposes of the incentive charges are to speed up the use and movement of boxcars and to encourage their prompt return of cars to their owners. Additionally, the funds received by the carriers from the incentive per diem charges are earmarked to be used to acquire or upgrade boxcars.

On April 24, 1973, the Commission reopened Ex Parte No. 252 (Sub-No. 1) for reconsideration of the following issues:

1. To determine whether the funds now earmarked for boxcars should be permitted to be drawn down for the acquisition of other types of cars in demand, like covered hoppers, and whether such modification would increase the number of boxcars available for general use.
2. To determine whether the existing test period average should be modified in any respect.
3. To determine whether a specified period should be prescribed within which incentive funds must be expended or committed to the acquisition of general service boxcars.
4. To determine whether carriers which fail to acquire their normal complement of such cars and, consequently, are unable to draw down the incentive funds within a specified period, should be required to return to funds collected to the debtor carriers.
5. To determine other methods to facilitate the use of the accrued incentive per diem funds for the purchase, building, or rebuilding of general service, unequipped boxcars.
6. To determine whether any group of carriers should be exempt from the payment of incentive per diem.

Modifications to the incentive per diem regulations were noted in a report of the Commission served April 8, 1975. The changes were the following:

- An expansion of the incentive per diem program to cars other than general service boxcars if:

  1. a record is made showing the car to be in short supply.
  2. a record is made showing a reluctance to expeditiously release the car by the terminating or delivering railroad.
  3. a record is made demonstrating that additional incentive to purchase the car is needed.
  4. a record is made showing such an extension of the incentive per diem program to be of general benefit.

- Allowance for modification of the test-period average upon a showing of good cause and proper notice. However, to insure an increase in the investment in freight cars incentive per diem expenditures must be matched by corporate fund expenditures.

- Permission for funds unexpended within the designated time period to be voluntarily surrendered to Rail Box. Failure to comply with the requirement that incentive per diem credit balances be timely spent or voluntarily surrendered to Rail Box will subject the violator to investigation by the Commission and possible penalty.
- To insure easy compliance with the requirements of these regulations and to readily identify incentive per diem funds spent, to be spent, unspent, or available for surrender to Rail Box, the Commission has prescribed the use of "funded accounting." Incentive per diem funds now on deposit in a general corporation bank account will have to be transferred to a separate bank account.
- Any incentive per diem payments collected, resulting in a net credit balance, must be spent within 18 months from the end of the year of collection.
- Incentive per diem funds which are unspent by creditor railroads are not refundable to the debtor railroads from whom they have been collected.
- Incentive per diem funds may be used for certain long-term leases. Nonequity leases must not include the cost of maintenance, will require a separate test period average and must be of at least 10 years in duration.
- No exemptions for any group of carriers from the payment of incentive per diem is granted.

Rail Box, which is one of the main reasons for the modifications, is one of the railroads' responses to the problem of inadequate car supply. In Finance Docket No. 27589, *American Rail Box Car Company and Trailer Train Company et al.—For Approval of the Pooling of Car Service with Respect to Box Cars*, and Finance Docket No. 27590, *Trailer Train Company et al.—For Approval of the Pooling of Car Service with Respect to Flat Cars*, the Commission approved, subject to conditions, the establishment of a pool of "free-running" box- and flatcars not encumbered by adherence to either the mandatory Car Service Rules 1 and 2 or car service orders issued by the Commission. The purpose of Rail Box and Trailer Train is to provide a potentially significant source of relief from current car shortages by increasing the nationwide supply of box- and flatcars, to increase actual car utilization, and to allow more flexibility of car movement. By making the cars "free-running," that is, not owned by any one railroad, it is anticipated that the cars will be more fully utilized. The ideal is that the cars would never be hauled empty, and could not be diverted from their normal activity by service orders or Car Service Rules 1 and 2. However, they would continue to be subject to emergency car service directives. Such a system has the potential of improving service.

Another major factor in securing proper car utilization is in providing adequate information regarding car movements. At the present time the AAR has in operation its Train II computer system which is designed to monitor car movements throughout the Nation. This system went into effect on June 15, 1975, thus, it is too early to determine its effectiveness. When Train II and any other systems are thoroughly tested, further solutions may become evident.

Train II was established to gather information on car movements, which could then be analyzed and used in improving car utilization. It has the potential of benefiting car use by reducing wasted car days, reducing empty car-miles, and improving operations in yards and terminals. It could improve the quality of service by improving the regularity of service, minimizing delays in transit, and reducing loss and damage by providing advance notification of the need for special equipment, thus allowing proper protective action to be taken. It could aid in improving car distribution by allowing for accurate forecasting of car needs. The system could also reduce clerical and administrative costs while at the same time assist the railroads in refining their own data base systems. The system could result in better service to the public.

The information gathered by Train II will be utilized by the railroads which have access to the computer readouts. Agencies of the Federal Government such as the Commission and DOT, however, do not, at the present time, have access to these readouts. In the Coordinator's view, the ICC could better fulfill its regulatory obligations if Train II information were available. However, there are presently no agreements outstanding between the ICC and the railroads or the ARR which would provide the ICC with access to Train II data. It is, therefore, suggested that an informal request for the Train II data be made to AAR. The availability of this information to the Commission could only inure to the benefit of the carriers through an improved car service program.

This is only one of many programs the AAR is formulating, all of which are designed to help the railroads operate more efficiently. According to the AAR, the lack of sufficient information available to the railroads is the main factor in their past inabilities to institute adequate service improvements. Several of the AAR projects are already in the planning stages. These include:

(1) A change from daily per diem to fractional day per diem.

(2) A clearinghouse to reduce the movement of empty cars, that is to utilize a credit system instead of physically returning the cars to their owners.

(3) An increase in time reliability.

(4) Advance notice by shippers of car orders.

In addition to these projects the AAR has ongoing a three-phrase, 8-year program, designed to improve car utilization.

Phase I—2-year program—to 1976:

(1) Analysis of current practices and problems.
(2) Development of car utilization measurement standards.
(3) Development of additional information on the car cycle.
(4) Development of recommendations regarding FRA programs on car utilization.
(5) Impact of AAR and ICC car service rules, orders, and directives.
(6) Freight car reliability studies.

Phase II—to apply the information gathered in phase I—1976-1978:

(1) A study of demand fluctuations for freight cars.
(2) Study bad-order and unserviceable car problems.
(3) Study customer practices.
(4) Study car distribution practices.
(5) Study assigned car problems, i.e., the efficiency of pools versus cars in general service.

Phase III—1978-completion:

(1) Improved education regarding car distribution practice.
(2) Equipment design study.
(3) Work rules study.
(4) Railroad policy study.
(5) Public policy study.

One of the AAR projects, the change from daily per diem to fractional day per diem, was noted by both the Special Projects Staff (SPS) and the respondent railroads. The SPS suggested that a change in per diem from a daily to an hourly basis could serve to increase car utilization. The respondent railroads noted the ongoing AAR project and suggested that any Commission action on per diem would be superfluous and wasteful. Additionally, section 212 of the RRRRA amended section 1(4)(a) of the Interstate Commerce Act, and provides:

> SEC. 212. (a) Section 1(14)(a) of the Interstate Commerce Act (49 U.S.C. 1(14)(a)) is amended to read as follows:
>
> "(14)(a) It is the intent of the Congress to encourage the purchase, acquisition, and efficient utilization of freight cars. In order to carry out such intent, the Commission may, upon complaint of an interested party or upon its own initiative without complaint, and after notice and an opportunity for a hearing, establish reasonable rules, regulations, and practices with respect to car service by common carriers by

railroad subject to this part, including (i) the compensation to be paid for the use of any locomotive, freight car, or other vehicle, (ii) the other terms of any contract, agreement, or arrangement for the use of any locomotive or other vehicle not owned by the carrier by which it is used (and whether or not owned by another carrier, shipper, or third party), and (iii) the penalties or other sanctions for nonobservance of such rules, regulations, or practices. In determining the rates of compensation to be paid for each type of freight car, the Commission shall give consideration to the transportation use of each type of freight car, to the national level of ownership of each such type of freight car, and to other factors affecting the adequacy of the national freight car supply. Such compensation shall be fixed on the basis of the elements of ownership expense involved in owning and maintaining each such type of freight car, including a fair return on the cost of such type of freight car (giving due consideration to current costs of capital, repairs, materials, parts, and labor). Such compensation may be increased by an incentive element which will, in the judgment of the Commission, provide just and reasonable compensation to freight car owners, contribute to sound car service practices (including efficient utilization and distribution of cars), and encourage the acquisition and maintenance of a car supply adequate to meet the needs of commerce and the national defense. The Commission shall not make any incentive element applicable to any type of freight car if the Commission finds that the supply of such type of freight car is adequate. The Commission may exempt such incentive element from the compensation to be paid by any carrier or group of carriers if the Commission finds that such an exemption is in the national interest."

(b) The Commission shall within 18 months after the date of enactment of this Act, revise its rules, regulations, and practices with respect to freight car service, in accordance with the amendment made by subsection (a) of this section.

These are just a few of the numerous programs which the AAR is currently engaged in and has planned in the near future in the area of car utilization. This is one area where the railroads are clearly taking the initiative to improve service. It is also an area where the Commission, as previously noted, has ongoing proceedings which will supplement the railroads' action and help to bring about adequate service to the public.

The placement of unclean or defective cars by the railroads is not only inefficient but tends to discourage the transportation of freight by rail common carriage. The Commission in the recent past has taken a number of steps designed to improve the condition of cars tendered for loading. In *Consignees' Obligation to Unload Rail Cars*, 340 I.C.C. 405, the Commission held that consignee had the duty to remove all dunnage, debris, and other foreign matter connected with inbound shipments, but that this duty "does not include the removal of paper and wooden grain doors, and other grain door debris, in unloading of boxcars used for the transportation of bulk grain or grain products." With respect to cars used to transport grain in *Loss and Damage Claims*, 346 I.C.C. 33, as modified by order dated October 16, 1975, the Commission prescribed the following regulations:

> 1. A car is not in suitable condition for the transportation of bulk grain and grain products when it is defective and a car is defective, among other reasons, when it has deteriorated doorsposts to which grain doors cannot be securely attached by the use of retention straps.
>
> 2. The rules prescribed in this part 1037, apply on shipments of bulk grain and grain products transported solely in railroad-owned and railroad-leased cars.
>
> 3. Cars with open-top linings tendered by the railroads may be used by the shipper without jeopardizing any subsequent claim which may be filed.

Another example of the Commission's interest in making certain that railroad cars are kept in a condition suitable for the loading of all types of commodities is the Commission's decision in Ex Parte No. 252 (Sub-No. 1), *Incentive Per Diem Charges—1968 (XF Cars)*, 350 I.C.C. 11. "XF" is the designation of cars suitable for the transportation of food products for human consumption. In order to expand this fleet the Commission, in the cited decision, authorized incentive per diem charges to be assessed on these cars. As indicated, the Commission has not hesitated in the past to take corrective action when necessary to insure an adequate supply of suitable equipment. The Commission in the future will, I am certain, continue its efforts in this regard.

TRACK MAINTENANCE AND REHABILITATION

The physical plant over which the trains operate greatly affects service capabilities. If the track and other appurtenant structures are not suitable for allowing passage of trains at reasonable speeds, service will be adversely affected. This problem of inadequate track facilities is most obvious in the Northeast where the effects of years of neglect and deferred maintenance are reflected in a great number of derailments and other service disruptions. Financial problems of the railroads in this area greatly contributed to serious deterioration in track facilities.

While the exact amount necessary for rehabilitation of rail facilities is not yet known, there have been numerous estimates. All of these reveal that the amount of money needed to revitalize the Nation's rail facilities is enormous. In the House appropriation hearings on the Federal Railroad Administration's proposed budget, it was noted that track improvements were a key to improved service. The cost of these improvements nationwide was estimated to be $30 billion over the next 10 years, of which the railroads were to pay $20 billion. To justify these enormous figures, statistics were produced which indicated that as of March 1974 nearly 8,000 miles of track were under slow order, and that 1,179 derailments had occurred during fiscal year 1974 as of February 1974. These statistics are indicative of the extensive need for improved maintenance and rehabilitation requiring a massive infusion of capital. The need for funds is so great that some type of Federal assistance appears necessary under current capital market conditions. However, reliance on Federal funding could create problems, either the amount of funds given to the railroads would be too small, resulting in an inadequate maintenance program, or the amount would be too great, resulting in the possibility of the utilization of funds in a wasteful manner.

The discussion thus far has dealt with potential Federal assistance for track and other appurtenant facility rehabilitation. As one of its recommendations calculated to improve car supply, the Fertilizer Institute urges that future rate increases be conditioned upon a given ratio of the proceeds derived from such increases being allocated to equipment improvements. Similar suggestions were made by others in Ex Parte Nos. 265 and 267. Although the size of the percentage is not specified by the Institute, the implication is that in the past respondents have failed to allocate sufficient funds for the development of modern facilities and equipment. Thus, conditioning the authorization of increased revenues directly upon the creation of a proportional pool or account for capital expenditures would, it is asserted, assure that consistent improvements in rail freight service would result.

In view of certain recent developments, disposition of the proposal that the Commission order the earmarking of certain percentages of freight rate increases should not be attempted in this proceeding. The Commission already has acted in certain respects on matters that bear on this question.

In Ex Parte No. 305, Nationwide Increase of Ten Percent in Freight Rates and Charges, 1974, the Commission enumerated several conditions to a nationwide 10-percent freight rate increase. One of these conditions was that revenues generated by the authorized increases, over and above the amount needed for increased material and supply costs, other than fuel, will be used by the railroads exclusively for reducing deferred maintenance of plant and equipment and delayed capital improvements in order that rail service will be improved. The Commission required the railroads to file reports showing the effect of the rate increase and the amount of money expended for elimination of deferred maintenance. The most recent figures available are for the quarter ending June 30, 1975. The reports show that total deferred maintenance of roadway as of June 30, 1975, was $2.5 billion. This figure represents the decline in deferred maintenance of $36 million experienced during the 9-month period ended March 30, 1975, but an increase of $3.9 million in the second quarter of 1975. Deferred maintenance of equipment was reported at $354.8 million, indicating an increase of $17.5 million between June 30, 1974, and June 30, 1975. Total delayed capital improvements of roadway declined $20.2 million to $2.1 billion since March 31, 1975. Delayed capital improvement of equipment increased $28.4 million since June 30, 1974, to $2.1 billion as of June 30, 1975. Of the $289.6 million in additional revenues resulting from the Ex Parte No. 305 rate increase in the second quarter of 1975, $98.8 million was used to satisfy increased costs for material and supplies, other than fuel, and $41.3 million was allocated for higher income taxes. This left $149.5 million available to overcome deferred maintenance and delayed capital improvements.

The Chesapeake and Ohio Railway Company, The Baltimore and Ohio Railroad Company, and Western Maryland Railway Company (the Chessie System) challenged the Commission's authority to impose the condition that certain amounts of the rate increase be utilized to eliminate deferred maintenance and capital improvements. A three-judge District Court for the Eastern District of Virginia, Richmond Division, in a decision rendered on April 22, 1975, found that the Commission lacked statutory authority to order a railroad how to spend its revenues, and ordered that the condition in Ex Parte No. 305 not be enforced against the Chessie System. The Commission has appealed this decision which will be decided by the United States Supreme Court. Considering the beneficial effect of reducing deferred maintenance and delayed capital improvements, it is recommended that the Commission request such additional legislation from Congress, should the District Court's decision be upheld. The amount of deferred maintenance and delayed capital improvement clearly show that the railroads either cannot or will not apply sufficient funds needed to maintain adequate facilities. Therefore, public assistance and/or authority to direct application of revenues derived from rate increases to specific problem areas appear to be the only alternatives.

Respondents have historically taken the position that the Federal Government is assisting their competitors in various ways. A part of the railroad industry's inability to maintain topnotch service has allegedly been this uneven governmental assistance program. The United States Railway Association in appendix H of its Preliminary System Plan has compiled information regarding governmental assistance to nonrail transportation. This report will mention only a few of the factors contained in that appendix.

In 1972, class I railroads spent 21 percent of their operating revenues on right-of-way facility maintenance. During the same period, rail-competitive motor carriers spent only 6 percent of their operating revenues on right-of-way facility maintenance. The assistance given to inland water carriers has been even greater. In fiscal year 1972 the Army Corps of Engineers expended $173 million on new waterway construction and $80 million on operations and maintenance. This Federal aid, as well as other Federal aid supplied by the U.S. Coast Guard and the Tennessee Valley Authority, allegedly resulted in the Northeast railroads' loss of a major share of the approximately $400 million of operating revenues to the region's barge operators. Federal subsidies for air transportation (actual and anticipated) have been even larger over the past decade. Federal expeditures for capital improvements plus operations and maintenance for air transport facilities totaled $10.8 billion for the period from 1966 to 1975. In fiscal year 1972, total Federal expenditures for air transport exceeded $1.5 billion. It has been determined that it is in the Nation's interest to foster and promote each mode of transportation which now receives Federal assistance. General freight rate increases are a limited procedure for maintaining adequate rail service to the public, especially when the economy is going through a period of recession combined with inflation. A more effective method of assuring adequate rail service lies in the hands of effective rail management combined with a balanced Federal transportation policy. As previously noted, Federal promotional policy has, in recent years, been directed primarily toward airway, highway, and waterway improvements. The railroads, on the other hand, have had for the most part to rely on their own resources in attempting to respond to the changing commodity consumption patterns, commodity flows, shifts in population, industrial production, and technological advances in competition with federally aided forms of transport. Federal assistance appears to be a necessary part of the solution of the enormous problems now existing in the rail industry.

The necessity, nature, and extent of Federal aid to railroads will be the subject of a comprehensive study by the Secretary of Transportation. This study is required by section 902 of the RRRRA. A time restriction is incorporated in the RRRRA which requires the study to be completed within 1 year from the date of enactment, February 5, 1976. The study shall contain (1) an analysis of past and present policies for providing Federal aid to railroads for construction, improvement, operation, and maintenance of rail facilities, (2) the relationship of these Federal aid policies to other modes of transportation, and (3) whether railroads have been disadvantaged by such policies. After completion of this study the Secretary will transmit to the Congress his findings and conclusions along with his recommendations for a sound and rational policy of Federal aid to railroads. This study should assist the Commission and other governmental bodies in the future.

However, Federal assistance will only work if proper controls on the expenditure of the funds are provided. The Commission has in the past sought authority from Congress to supplement the Interstate Commerce Act to gain authority over the transfer of assests to transportation holding companies. It has been the Commission's concern that these holding companies have the potential of draining the financial resources from their transportation affiliates, and thus diminish the ability of such transportation affiliates to provide adequate service.

If sufficient control over the expenditure of Federal aid is not provided, the funds might never be utilized properly. If the assistance is provided and properly allocated to the task of eliminating the deferred rail facility maintenance and rehabilitation problems which now exist, better service can surely be provided the Nation's railroads.

DEMURRAGE AND FREE-TIME ALLOWANCES

Demurrage is a charge assessed against shippers and consignees for the detention of freight cars beyond the free time allotted for loading and unloading. Demurrage is imposed in part as a penalty to induce the expeditious release of freight cars. Additionally, demurrage provides a revenue offset to the per diem charges incurred by the nonowner railroad to the owner of the car. Section 211 of RRRRA amends section 1(6) of the Interstate Commerce Act by adding "Demurrage charges shall be computed and rules and regulations relating to such charges shall be established in such a manner as to fulfill the national needs with respect to (a) freight car utilization and distribution, and (b) maintenance of an adequate freight car supply available for transportation of property."

The Commission has long shared Congress' concerns regarding the use of demurrage to improve freight car utilization and distribution to facilitate the maintenance of an adequate freight car supply. For example, in *The Car Peddling Case*, 45 I.C.C. 494, 503 (1917), the Commission stated:

> In the belief that higher charges would tend to force cars being detained by shippers at destination, for their purely selfish or individual reasons, into the service of shippers waiting for cars in which to move their traffic, the Commission in a number of instances during the past few months has sanctioned increased demurrage charges; and in the interest of the general shipping public and in order to keep the cars of the carriers employed as much as possible in the actual carriage of commerce, the Commission, over the protests of shippers whose individual or private interests were promoted by the longer free time for unloading at destination, has permitted many tariff rules to become effective by which the free time has been reduced.

During the ensuing years the Commission had continously been active in this area. See, for example, *Export Freight Free Time*, 47 I.C.C. 162 (1917), *Increased Demurrage Charges 1956*, 300 I.C.C. 577 (1956), *Demurrage Rules and Charges, Nationwide*, 340 I.C.C. 83 (1971), and *Car Demurrage Rules, Nationwide*, 350 I.C.C. 777 (1975). Where the level of the demurrage charge was found too low to induce the release of a freight car during or shortly after the expiration of the free time, the charges were increased. In 1880 the charge was $1 per car per day. By 1971, the charge was increased to $10 per car per day for the first 4 days after the expiration of the free time, $20 per car per day for the next 2 days, and $30 per car per day for each day thereafter.

There is still a question as to the efficacy of demurrage on a deterrent to the undue detention of cars. For example, in his comments favoring enactment of S. 1730 (92d Cong., 1st Sess., the National Freight Car Corporation Bill), the chief executive officer of the Southern Railway Company, a participating respondent herein, had the following to say about car detention in response to questions put to him by Senator Hartke:

> *** But let me mention some of the things that are definitely needed. I don't think it's generally realized, for example, that a general service car, which I place at a shipper's dock at 8 o'clock on a Friday morning, does not have to be released to me, does not have to be loaded, and released to me, until the following Wednesday morning at 7 a.m.

> Now, the Commission doesn't have the authority to regulate the shipper's use of cars. There are presently pending some proceedings with respect to demurrage charges. I think demurrage charges are too low but leaving that out of it, let's see what they are—charges which are compensation paid to the railroad when the car is used for storage and other things.
>
> There ought to be penalties or fines, that could be imposed and that would be payable to the Government. I don't like people saying, demurrage charges are back-door ways or getting rate increases for railroads. I am not interested in getting that money; I don't want that; I want the car back.
>
> Senator Hartke: You want the use of the car.
>
> Mr. Claytor: That is right. Since the greatest waste of freight cars is the waste that is now associated with their use for other than transportation, this is something we really need to work on and move into.[14]

The detention of railroad freight cars for the purpose of loading and unloading is governed by the National Demurrage Tariff. This tariff was first filed in 1919 and provided for a 48-hour free-time period. To increase the economic incentive to release cars and to improve car utilization a Special Demurrage Program was instituted by the carriers which showed that, through incentives offered in that program, the result was that only 13.1 percent of the cars were detained more than 24 hours. The carriers, based on the results of the study, proposed revision of the car demurrage rules by reducing the free-time period to 24 hours. In *Car Demurrage Rules, Nationwide, supra,* the proposal was found to be just and reasonable and otherwise lawful, as part of a Commission program to improve equipment utilization and provide an adequate freight car supply. See *Investigation of Adequacy of Freight Car Ownership*, 323 I.C.C. 48 (1964); *Incentive Per Diem Charges—1968*, 337 I.C.C. 183 and 217, and 349 I.C.C. 303; and *Demurrage Rules and Charges, Nationwide, supra.*

The relationship between service and car supply enhancement through the timely release of cars was clearly discussed by the Commission as follows:

> Protestant shippers state that they are doing the best job possible and cannot release more cars within 24 hours than they do now. The problem, as they see it, is not in the physical loading and release, but in the manner and condition which cars are supplied by the railroads. There is no question that the service now provided by the rail carriers leaves a lot to be desired. However, much of the poor and erratic service provided by respondents stems from the shortage of freight cars. It is axiomatic that when there is a shortage of equipment the ability to supply cars on an appointed date in the amounts requested will suffer. As shown in Commission proceedings cited

---

[14] Report of Special Subcommittee of Freight Car Shortage of the Committee on Commerce, *supra*, at page 160.

> earlier herein, the Commission has recognized the problem and taken steps to increase the supply of cars and improve utilization by providing incentives to purchase additional boxcars, by making car service rules mandatory and by approving increases in demurrage payments. In addition, the Commission has invoked numerous service orders and embargoes during emergency situations which it believed would relieve extreme situations. We look upon the subject proposal as another opportunity to alleviate the ever-present shortage of freight cars. Respondents claim that the proposed reduction in free time will result in a saving of 3 million car-days which would be equivalent to providing 8,210 additional cars. If only half that amount were realized it would be a significant contribution to the Nation's overall car fleet. The addition of that many cars will result in improved service which in turn should provide shippers with a better opportunity to release cars more promptly. *Car Demurrage Rules, Nationwide, supra,* at page 798.

The protestant shippers have appealed this decision but no court decision has yet been rendered.

Two current pending Commission rulemaking proceedings, Ex Parte No. 285, *Maintenance of Records Pertaining to Demurrage, Detention, and other Related Accessorial Charges by Rail Common Carriers of Property;* and Ex Parte No. 289, *Remittance of Demurrage Charges*, 349 I.C.C. 411, demonstrate the continuing concern of the Commission.

Ex Parte No. 285 is investigating the need for requiring the railroads to maintain records to facilitate the correct assessment and collection of all applicable detention accessorial and demurrage charges. One of the central issues in this proceeding is whether the rail carriers are failing to collect demurrage charges, thereby exacerbating the car supply problem.

Recognizing that in many instances the railroad owner of the car receives only a small portion of the demurrage charge which acts as a disincentive to the nonowning railroad to expedite the return of the car since it retains demurrage charges which exceed its per diem expenses, the Commission instituted Ex Parte No. 289, supra. The rules proposed in Ex Parte No. 289 would require the delivering carrier to remit to the railroad owner of the car all demurrage charges collected in excess of $10 per car per day. This action would nullify any benefit the nonowning railroad would gain from the detention of foreign freight cars. Additionally, since the per diem charge is less than the potential revenue the owner can earn from use of the car, the proposal would encourage the acquisition of additional cars. The $10 per day per car after the expiration of free time by the delivering carrier appears adequate compensation for the payment of per diem charges and use of track space resulting from the detention of foreign freight cars.

The pending decisions, rulemaking, and recent statutory modifications which will necessitate additional proceedings relating to car detention and car-hire make it unnecessary, in the Coordinator's opinion, to institute another investigation to further consider the allegation with respect to demurrage set forth on this record.

ALTERNATE RATE STRUCTURE

General Mills, a major processor of foodstuffs that ships substantial quantities of its products by rail, is among those shipper participants which urge the Commission to take a different approach toward improving the quality of railroad freight service. It suggests that this can best be done by relating the rates authorized by the Commission to the service actually rendered by railroads. By way of introduction, its proposal calls for the use of economic incentives in order to have rail management's ability to control the movement of freight cars and to maximize their utilization reflected in the quality of service.

General Mills' plan calls for the publication of alternative rate structures for the same service routes. Basically, the lower rate structure would be the present level of rates charged by railroads. It is important to note (1) that standards of performance would be governed by the present legal consideration of "reasonable dispatch," and (2) that assessment of a higher level of rates would be based upon effectuation of controlled standards deemed to be within the *capability* of efficiently operated railroads. Failure to meet the controlled in-transit norms without justification (such justification being limited to matters beyond the control of the participating carriers, such as acts of God, acts of public authority, or default of the shipper) would result in damages *automatically* being deducted or set off by the shipper to the level of the lower rate structure. General Mills advocates this as an exclusive remedy and, in effect, shippers would, with certain unspecified exceptions, forfeit all other rights of redress presently available to them.

The concept of a two-level rate structure, notwithstanding the pendency of the Commission's investigation into the current rate structure in Ex Parte No. 270, has the positive effect of giving shippers and receivers a form of redress for losses due to transit delay where proof of injury and the causes of injury are oftentimes difficult to determine. It also would seem to provide respondents with an *economic* incentive to improve the quality of their service in all areas in which they are able to do so in order to qualify for participation in the higher rate structure. In those respects the proposal represents a significant and, perhaps, forward-looking change in traditional methods of transportation pricing.

On the negative side, however, the plan is fatally vague in areas where detail and precision are essential. Without further clarification of the conditions of the plan, the mechanics of its operation, and the legal and other barriers discussed above with respect to shippers' proposals urging the Commission to define reasonable dispatch and to adopt a system of reciprocal demurrage, its feasibility is left in doubt. Also, if given widespread application, the proposal is subject to the same objections already raised against the tariff publication of service time schedules and would not be feasible for the same reasons. It is impossible to conclude, therefore, that serious impediments would not be encountered were General Mills' suggestion to be followed. In addition, the plan is not closely related to the capacity to serve; rather it is related directly to current performance levels. It has already been stressed that the adequacy of current performance cannot even remotely be determined or objectively and scientifically evaluated until service capabilities are more precisely established.

The existence of an automatic, exclusive remedy is fundamental to the functioning of the plan. This presents major problems in that it causes the plan to fall victim to the provisions of section 20(11) of the act. In view of General Mills' failure to specify what exceptions, if any, it has in mind and when they would apply to shippers' forfeiture of all other legal remedies, a rational determination cannot be made that the plan should be adopted. Admittedly, in a rulemaking proceeding, the Commission is empowered to act in a quasi-legislative fashion. Except for released rates, the Commission, however, is effectively prohibited by Congress in section 20(11) of the act from sanctioning any proposal having the effect of limiting the liability of general freight transporters for damages they cause by reason of their breach or default of their common law or statutory duties to the general shipping public.

It is the purpose of this proceeding to try to restore and promote at least one level of freight service and to make it substantially adequate to meet the reasonable transportation requirements of the great bulk of shippers and receivers who use the service of railroads. Keeping in mind earlier references to the fact that the Nation's railroads form a network, two levels of quality in rail service should not be required if any credence is to be given to respondents' assertions regarding the poor financial condition of certain railroads. The public interest in general would better be served by the implementation of concise standards of general service performance based upon the ability to serve. That is what has been attempted herein. General Mills' broad sweeping proposal, on the other hand, incorporates a vague application of "reasonable dispatch," which has not yet been defined, and it is indelibly wedded to a limitation of respondents' liability. Accordingly, the Coordinator recommends that the proposal be rejected at this juncture. This recommendation should not be construed as rejecting incentive or special rate proposals, which could be effective in particular circumstances where they have been shown to be just and reasonable and otherwise lawful.

The concept of a special service rate system has been considered by the Commission on a case-by-case basis when proposed by the carriers. Premium charges for an expedited service are clearly appropriate. However, lower rates based on service less than with reasonable dispatch have not been permitted, *Bills of Lading*, 52 I.C.C. 671 (1919). One aspect of a special service rate system that has been proposed at different times by the carriers which has not been sanctioned by the Commission is that known as "contract rates."

In two cases decided in 1961, the Commission held that contract rates with guaranteed tonnage commitments would destroy competition between different modes of carriers for the duration of the contract, thus violating the national transportation policy which precedes section 1 and requires the Commission to administer the act so as to:

> *** recognize and preserve the inherent advantages of each [mode of transportation and] *** encourage the establishment and maintenance of reasonable charges for transportation services, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices ***.

In the 1961 cases involving contract rates with guaranteed tonnage commitments, the Commission stated that, "carriers which require our approval of their rates should be on notice that, in the absence of a statutory amendment [to the act], contract rates and agreed charges are deemed to be *unlawful per se*."[15] [Emphasis added.]

Mention was also made in these cases of the ability of Canadian rail carriers to enter into contracts with a named shipper whereby a special rate is charged by the carrier in return for a guaranteed percentage of a shipper's traffic between points specified in the contract. Agreed charges were first authorized in Canada in 1938 under Part IV of the Transport Act. This legislation was patterned on a similar piece of legislation enacted in the United Kingdom in 1933 under the Road and Rail Traffic Act. Such charges were specifically authorized to aid the railroads to cope more effectively with competition from other modes of transportation, especially motor transport.

The Canadian law has provisions which allow other carriers to join in the agreement, providing certain conditions exist. It also has provisions which allow any shipper, carriers, association representing shippers or association representing motor vehicle operators to call for an investigation of the contract agreed charges if they feel the contract will result in unfair discrimination against them. If the unfair discrimination is proved, the Canadian Transport Commission may enter an order varying or cancelling the agreed charge or any other order it deems appropriate. The recent amendments to the act, while seeking to encourage competition and facilitate the publication of demand-sensitive rates and separate rates for distinct rail services, do not specifically permit the publication of contract rates.

The Commission has always encouraged innovative ratemaking[16] by the carriers who have the managerial discretion[17] to establish rates, and the following provisions of RRRRA present the Commission with new authority to promote innovative ratemaking:

> (17) Within 1 year after the date of enactment of this paragraph, the Commission shall establish, by rule, standards and expeditious procedures for the establishment of railroad rates based on seasonal, regional, or peak-period demand for rail services.

---

[15] *Contract Rates, Rugs and Carpeting from Amsterdam, N.Y.*, 313 I.C.C. 247 (1961); and *Guaranteed Rates, Sault Ste. Marie, Ontario, to Chicago*, 315 I.C.C. 311 (1961).

[16] For example, see *Grain By Rent-A-Train, IFA Territory to Gulf Ports*, 339 I.C.C. 579, which involved a novel form of ratemaking to meet the needs of a landlocked area of Illinois. The Commission stated "In publishing that tariff, the respondent is seeking to maximize its profits, an important, if not the most important, function of management", and *Substituted Service—Piggyback*, 322 I.C.C. 301, which was a Commission instituted investigation to facilitate the development of TOFC operations through the exploration of new approaches to piggyback service.

[17] *Hanna Mining Co. v. Missouri Pac. R. Co.*, 332 I.C.C. 166.

Such standards and procedures shall be designed to (a) provide sufficient incentive to shippers to reduce peak-period shipments, through rescheduling and advance planning; (b) generate additional revenues for the railroads; and (c) improve (i) the utilization of the national supply of freight cars, (ii) the movement of goods by rail, (iii) levels of employment by railroads, and (iv) the financial stability of markets served by railroads. Following the establishment of such standards and procedures, the Commission shall prepare and submit to the Congress annual reports on the implementation of such rates, including recommendations with respect to the need, if any, for additional legislation to facilitate the establishment of such demand-sensitive rates.

(18) In order to encourage competition, to promote increased reinvestment by railroads, and to encourage and facilitate increased nonrailroad investment in the production of rail services, a carrier by railroad subject to this part may, upon its own initiative or upon the request of any shipper or receiver of freight, file separate rates for distinct rail services. Within 1 year after the date of enactment of this paragraph, the Commission shall establish, by rule, expeditious precedures for permitting publication of separate rates for distinct rail services in order to (a) encourage the pricing of such services in accordance with the carrier's cash-outlays for such services and the demand therefor, and (b) enable shippers and receivers to evaluate all transportation and related charges and alternatives.

RECIPROCAL DEMURRAGE

Southwest Oregon Shippers' Traffic Association Inc., urges adoption of a plan it calls "reciprocal demurrage." Under the plan shippers would be entitled to recover from origin carriers "special monetary damages" when cars are not furnished in accordance with written car orders. Respondents, on the other hand, argue that the imposition of penalties and the adoption of more stringent regulations assumes that motivation on the part of railroad management to improve service is lacking. Respondents also contend that such regulations and penalties would, if adopted, thwart progress currently being made. The Union Pacific Railroad suggests that the cost of reciprocal demurrage to railroads would be prohibitive and that the other proposals made by shippers overlook the fact that shippers also contribute to car delays by requesting such services as inspection, switching special cars, and diverting cars in transit. Union Pacific also argues that these factors preclude the possibility of respondents' publishing their service schedules.

For practical and other reasons regulations that attempt obliquely to prescribe liquidated damages should not be established. To do so in a fashion similar to that by which demurrage is assessed against shippers for the detention of cars, moreover, cannot be justified. Among other things, demurrage is not a method designed for the awarding of damages.

Some of the practical problems of the concept of reciprocal demurrage are set forth in terms of the capabilities of railroads in the discussion of the topic which appears in *Car Shortage—Insufficient Transportation Facilities*, 12 I.C.C. 561 (1907), beginning at page 574. The gist of that discussion is exemplified in the following excerpt taken from page 575:

> [Reciprocal demurrage] will not build railroad track, equipment, enlarge and simplify terminals, nor transform incompetent operating officials into first-class railroad men, but it might stimulate, energize, and in some cases revolutionize the methods of deliquent [sic] railroads so that they would render the service which they were created to render. This is the theory of reciprocal demurrage. But that of itself it will enable the railroads to render adequate service is not demonstrated by experience."

Time has not altered the appropriateness of the finding. Demurrage is a procedure designed for two purposes: (1) to compensate railroads for the use of cars and tracks, and (2) to stimulate the release of cars by shippers and receivers; demurrage will be discussed in more detail in the next section of this report. The point here, however, is that reciprocal demurrage or any other similar method of assessing liquidated damages, in addition to the possibility of its being an ill-conceived experiment which respondents and the public can ill-afford at this time, would be difficult to reconcile with that body of transportation law applicable to refusals to serve and claims for delay.

Carriers have the duty to serve and to transport property with reasonable dispatch. And the provisions of section 20(11) of the act provide that carriers are to be held accountable for the full actual loss, damage, or injury to the property entrusted to them for transportation. These remedies cannot be ignored. Analysis of the proposal that the Commission establish reciprocal demurrage indicates proponents may have overlooked these remedies or failed to indicate why the provisions of section 20(11) are inadequate.

"The "experience" referred to was that in *Houston & Texas Central Railroad Company v. Mayes*, 201 U.S. 321 (1906), the applicability to interstate commerce of a Texas statute for reciprocal demurrage was invalidated by the Supreme Court. The Court held that the statute which placed an absolute burden upon railroads transcended the legitimate police powers of the Texas legislature in that it failed to recognize the exigencies of transportation and the occasional physical impossibility for a railroad to furnish a car.

For a later case before the Supreme Court involving a Minnesota statute which, had it not been held to be in conflict with the Hepburn Amendment enacted in 1906, would have made railroads liable to shippers for the failure to furnish cars, see *C. R. I. & P. v. Hardwick Elevator Co.*, 226 U.S. 426 (1913).

Any plan whereby a progressive scale of liquidated damages would be assessed against a defaulting carrier would, in effect, be a penalty system. What has been proposed, then, while it might operate in principle similar to demurrage, does not resemble the true nature of demurrage. Once a standard has been established and a carrier fails to meet that standard, the carrier would become liable under the proposal to the party contracting for its service. Liability would be based solely upon a lapse of time beyond the standard. A scale of reciprocal demurrage charges would be determinative of the amount recoverable. Reciprocal demurrage, absent a showing of mitigating factors or legal excuses, thus would be levied automatically; proof by shippers or consignees that they or the property shipped had sustained actual or consequential damages apparently would not be required under the plan proposed, in contravention of the standards of due process.

The conventional application of demurrage is intended to be an important tool in stimulating car utilization.[19] Rather than reflect the true value of the revenue-generating capacity of a railcar, or its cost of acquisition and maintenance, demurrage charges traditionally have been directed only toward discouraging the detention of cars. Detention often results from the tendency of some customers to use cars as storehouses for their goods and by providing penalties for it. Demurrage encourages users to release equipment back to railroads generally sooner than the exigencies of due course in business otherwise might dictate. This is done in the public interest; it is not done in the sole interest of railroads but in consideration of the needs of other shippers for cars.

The proposal made by shippers, however, is that demurrage, in some form, be applied to predetermined standards (not contained in the proposal) or to railroad operations generally, including the provision of cars. A number of practical and legal hurdles arise both as to the plan itself and the fact that it calls for the assessment of liquidated damages.

Earlier herein the need for and absence of data on respondents' capacity was discussed. In order to set standards for performance, the ability to serve must first be known. See *Houston & Texas Central Railroad Company* v. *Mayes, supra.*

---

[19] Although the basic issue involved in *Middle Atlantic Conference, et al.* v. *United States*, 353 F. Supp. 1109 (D.C. 1972), was whether motor common carriers may provide in their tariffs that persons other than consignors and consignees named in bills of lading may be made liable for the undue detention of trucks being loaded or unloaded, the opinion and footnotes thereto contain many references to and explanations of the customs, law, and theory of demurrage as it originated in maritime shipping and later developed in railroad and motor carrier transportation.

Limitation of common carrier liability is controlled expressly by statute in certain respects. The provisions of section 20(11) apply, for example, to the delay of freight in transit. Therefore, those provisions also must be weighed in reviewing the possible implications of the reciprocal demurrage plan proposed. Section 20(11) provides, in part, that any carrier receiving property for transportation issue a receipt or bill of lading therefor. That section provides further that the carrier:

> *** shall be liable to the lawful holder thereof for any loss, damage, or injury to such *property* caused by it or by any common carrier, railroad, or transportation company to which such property may be delivered or over whose line or lines such property may pass *** and no contract, receipt, rule, regulation, or other limitation *of any character whatsoever* shall exempt such common carrier, railroad or transportation company from the liability hereby imposed ***. [Emphasis added.]

With particular reference to reciprocal demurrage and the effect such a system foreseeably might have upon the expansion or limitation of a railroad's liability for loss, damage, or injury to a shipment the following excerpt from section 20(11) also must be noted:

> *** and any such limitation [of liability], *without respect to the manner or form in which it is sought to be made* is hereby declared to be unlawful and void ***. [Emphasis added.]

Although the Commission is given in other provisions of section 20(11) broad discretionary power to authorize by order released rates for the purpose of limiting carrier liability, no power is vested in the Commission which would enable it to expand or limit a carrier's liability for a refusal to serve or for unreasonable delay. Moreover, the Commission has consistently denied all applications for released rates limiting carrier liability when the rates were not restricted to particular commodities and circumstances. See *Released Rate Rules—National M. Freight Classification* 306 I.C.C. 495 (1959). Thus, the proposition that reciprocal demurrage be established so that charges may be assessed against a carrier for failure to provide a car upon the lapse of a predetermined period of time should not be sanctioned by the Commission. Accordingly, the Coordinator suggests that the proposal not be adopted and shippers' request therefor be denied.

The converse of the problem of a shipper not being provided with an ample number of cars is the problem of bunching. This occurs when cars which leave a common origin at varying times are delivered simultaneously and in such a great number that the consignee is unable to unload and release the cars back to the carrier quickly enough to prevent the cars from piling up at its premises. The accumulated cars cannot be unloaded in a timely manner and, as a result, the cars become unwanted warehouses. These cars sit, fully loaded, until the shipper finds the time and the resources to unload them, resulting in gross misutilization. At the present time, Tariff 45, Demurrage Rules and Charges, Rule 8, Section B-Bunching contains provisions which allow the consignee additional free time when bunching occurs. The rule has an adequate reason behind its existence; however, bunching, by its very nature creates a misutilization of cars. The rulemaking and studies recommended with regard to terminals are designed to alleviate this problem (see appendixes E and F).

EARMARKING PERCENTAGES OF REVENUE

As one of its recommendations calculated to improve car supply, the Fertilizer Institute urges that future rate increases be conditioned upon a given ratio of the proceeds derived from such increases being allocated to equipment improvements. Similar suggestions were made by others in Ex Parte Nos. 265 and 267. Although the size of the percentage is not specified by the Institute, the implication is that in the past respondents have failed to allocate sufficient funds for the development of modern facilities and equipment. Thus, conditioning the authorization of increased revenues directly upon the creation of a proportional pool or account for capital expenditures would, it is asserted, assure that consistent improvements in rail freight service would result.

In view of certain recent developments, disposition of the proposal that the Commission order the earmarking of certain percentages of freight rate increases should not be attempted in this proceeding. The Commission already has acted in Ex Parte No. 305, Nationwide Increase of Ten Percent in Freight Rates and Charges, 1974, wherein approval of the rate increase was conditioned upon by the recipients of the increase allocating a portion of the increase for the reduction of deferred maintenance and delayed capital improvements.

On April 22, 1975, the United States District Court for the Eastern District of Virginia, Richmond Division, found that the Commission did not have the express statutory authority to condition its approval of the rate increase in Ex Parte No. 305. (See the section on Track Maintenance and Rehabilitation for a more detailed discussion.) Until the Commission can exercise such authority either through a specific statutory grant or from further court action, no further consideration can be given the concept of earmarking a percentage of authorized revenue increases.

SHIPPER-CARRIER CONFERENCE

Weyerhaeuser Company, which ships annually in excess of 80,000 carloads of finished wood and fiber-based products states that its service requirements fall into two categories; adequate car supply and predictable in-transit times. The National Associaton of Secondary Material Industries, Inc., which has a membership of 700 firms, avers that its members annually ship in excess of 200,000 carloads of nonferrous metal scrap, paper waste, and textile waste. Those participants, among others, recommend that the Commission sponsor shipper-carrier conferences so that the interchange of vital information with respect to rail freight service and the quality of it will be assured.

While no specific agenda or format is suggested by proponents of such conferences, presumably the interaction among interested parties attending them would lend itself to finding solutions to some of the problems that contribute to service inadequacies. Cementing unity of interest also might be expected to follow such meetings and this could be an important achievement because an element of bitterness is apparent in this record.

The instant proposal could tend to "officialize" proceedings which otherwise might be accorded less significance and attention by carriers, shippers, and receivers. Although that might seem to be desirable in certain respects, whatever might be gained by the Commission's formal sanction of such conferences or its monitoring them could be surpassed by the forfeiture of close analysis of the many variables in railroad freight operations and those particular and distinctive transportation requirements of individual shippers and groups of shippers with common interests that need to be reviewed.

It is true that it is collective needs that must be filled. However, defining needs specifically and having them filled efficiently are not likely to follow. Broad discussions in general terms would seem to be all that could be accomplished, initially at least, at such meetings. Knowledge of national trends is important, of course, but panaceas that might be offered at such meetings, prior to learning the facts of real service capacity, could possibly add to the rancor that already exists.

The proposal should not be dismissed entirely. After the Commission has had an opportunity objectively to assess the capacity of the national rail network, the Commission's active participation in such conferences might well be worthwhile. A decision to call for such conferences and have them sponsored by the Commission at this time, however, should be deferred. The Commission has often demonstrated that it would welcome shippers with a community of interest communicating their specific problems and proposals for solutions which may be addressed in such conferences. The Commission has in the past sponsored conferences between shippers and carriers. One such conference was the Productivity Measurement Conference, sponsored by the Commission's Bureau of Economics, and held on November 26, 1974. It was the Commission which initiated this conference, and in the future, with set agendas, such conferences could be planned and carried forth.

RAILROAD ELECTRIFICATION

The topics discussed thus far in this report have dealt with either the specific symptoms of inadequate rail freight service or the elements of rail freight service. These previously discussed topics, however, do not represent all of the symptoms of inadequate rail freight service or all the elements of rail freight service. Because this investigation deals with all the aspects of rail freight service, it is necessary to consider developments and experiments in rail operations which may have an impact upon rail service now or at some time in the future. For the most part, these are topics which have been determined not to be the proper subject of rulemaking at the present time.

After World War II most of the European nations elected to construct the equipment necessary to electrify their rail systems. The railroads in the United States did not face the same problems the Europeans had after the war and continued their development of the diesel locomotive. As a result of this decision to continue the use of diesel operations, according to the annual reports filed with the Commission by the railroads, as of December 31, 1974, there were less than 1,200 miles of road operated under electrification in the United States by class I line-haul railroads. This represents less than 1 percent of the line mileage operated by these carriers.

The total mileage operated by the class I line-haul railroads as of December 31, 1974 was about 311,000 miles which is composed of 238,000 miles of main lines and passing tracks and 73,000 miles of way and yard switching tracks. It has been noted by the Edison Electric Institute which prepared a study and reported in 1970, that there were about 22,000 track miles of U.S. railroads which carried a traffic density sufficient to make electrification economically feasible. The energy considerations of the 1970's may have increased the mileage susceptible to economical electrification.

A number of railroads have also studied the concept of electrification. Railway Age reports that since the 1960's at least 16 U.S. and Canadian roads have been involved in studying the feasibility of electrification. Only six, however, can be considered serious candidates for initiating electrification. Almost all of these are located in the West and South, where traffic growth is greatest and earnings are relatively good.

Based on the best available estimates, the cost per mile for a catenary system ranged from $55,000 to $100,000. The lower cost represented more long tangent sections of track, few sharp curves, which require closer spacing of catenary supports, minimal bridge and tunnel clearance problems, and good site and accessibility conditions. This is the major cost involved in electrifying a route. However, the electrification will result in interference with presently existing communication systems. Therefore, if a route is electrified, existing communications systems would have to be revised or replaced, resulting in additional costs.

Once the route is electrified, diesel locomotives obviously will be replaced by electric locomotives, again incurring additional expense which would be offset, to some extent, by the concomitant diminution of diesel locomotives purchased and lower maintenance costs. General Electric is the leader in electrification installations in this country and currently, it is the only manufacturer in the United States producing electric locomotives for the existing systems. However, General Motors has now entered the market and according to an article in the Railway Age issue of March 10, 1975. This unit, developing 6,000 hp., was scheduled for completion in 1975. GM also expects to have another large unit, 10,000 hp., completed by early 1976. Current manufacturers appear capable of meeting electrification requirements since it is estimated such a program would be spread over a period of 3 to 5 years.

The primary resistence to electrification is the high initial cost of the system including equipment. Today, the recession has taken its toll on railroad revenues and as there must be a profit motive attached to any expenditure of this size, it must be shown that electrification would produce a profit in order to justify private investment. At $100,000 a mile the estimated cost of the 22,000 miles considered economically feasible to electrify would be $2.2 billion. The cost of an electric locomotive is about double that of a diesel locomotive or about $750,000, and it is estimated that 4,200 units would be required, resulting in a cost of $3.2 billion.

To render electrification feasible, the longrun benefits must offset these initial costs. Electrification has some advantages over diesel operations. Some of the main advantages as reported in Railway Age are:

1. Electric locomotives have fewer moving parts and require less generator power to operate.
2. Performance of the electric locomotive in high-speed heavy haulage is up to three times greater than the diesel electric of the same horsepower rating.
3. Useful life of the electric locomotive is expected to be twice as long as the diesel.
4. Lubricant and maintenance costs for electric power are only a fourth to a third as much as those for diesel-electric power.
5. Availability due to reduction in downtime is increased by at least 10 percent over the diesel.

According to an article written by Mr. William D. Middleton of the Railway Age issue of March 10, 1975, electric power has a cost advantage over diesel oil. Quoted below is an excerpt.

> While no energy source can be considered immune to significant price escalation in the years ahead, electric power, because it is not tied to any particular fuel source, promises at least relative price stability in comparison with oil fuels. One view of the potential magnitude of this disparity in price escalation is provided by guidelines recently established by the U.S. Navy for long-range economic analysis of energy conservation projects. Energy costs, according to the Navy projections, are expected to increase at a rate of 9% annually for oil fuels, compared to a rate of only 3% for electric power. Thus, electrification has already gained a significant fuel cost advantage over diesel traction, and the margin is likely to be a steadily increasing one.

The main reason for the European conversion to electrification was the lack of domestic oil reserves which were necessary to conduct an economical diesel operation. In the U.S. the existence of cheap oil allowed the continued use of diesel operations. For example, diesel oil prices remained stable for approximately 20 years, between 1950 and 1969, when the prices were 9.5 cents and 10.17 cents per gallon, respectively. However, the oil crisis has ended the overwhelming economic advantage which diesel operations enjoyed in the U.S.

The oil crisis still exists and higher prices for fuel are continuing, and long-term prospects are no more encouraging. Since 1968 when the price was 9.94 cents per gallon, the cost has risen three times as high with some railroads currently paying 30 cents per gallon. This added cost has been detrimental to the financial condition of the industry. If the railroads converted to electric power they could free themselves of dependence on diesel oil as the source of power. Central electrical power generating stations are capable of using other sources of fuel, such as coal, gas, nuclear, or hydro power.

The railroad industry uses about 4 billion gallons of diesel oil annually, and it has been estimated that nearly 3 billion gallons of diesel fuel could be saved if the industry converted to electricity. This reduction in oil consumption appears to be in our national interest and could be one step in the quest for energy independance. In addition it will aid in conserving what oil reserves exist and defer the day when the oil reserves are totally depleted. At that time railroad electrification may be a necessity not an alternative.

While electrification has definite advantage over dieselization, the original large sum required for the initial installation remains the primary deterent to bring it to fruition. If Government funds were to be made available, either on a matching basis or other means, many railroads may be willing to actively participate in electrification. It has been suggested that electrification of the railroad industry would effect a dramatic change, through operating efficiency and productivity, comparable to that experienced by the conversion from steam power to diesel electric motive power 25 years ago. The Coordinator is fully aware of the fact that the railroads of this Nation do not have the financial resources necessary to commence electrification of large segments of track. This is certainly an area that would warrant involvement by the appropriate governmental bodies to assure the full benefits of electrification will accrue to the Nation.

UTILIZATION OF "SHORT TRAINS"

Traditonal railroad operating practice has been that longer trains are operationally sound because the costs of operating trains which are as long as technology permits are considered the most economical. One of the underlying premises upon which this conclusion is based is that labor costs are the predominant expense in rail operations. Therefore, by operating long trains, labor costs are kept low and presumably the operation will be profitable. This statement may still be true in theory, but the adverse effects of long trains upon rail operations, facilities, and service may be so substantial that investigation into the possible benefits of shorter trains is warranted.

A study on the concept of short trains, entitled *A Study of the Economics of Short Trains,* by Robert A. Leilich, was published in June 1974. One of the theories dealt with in that study was the possibility that longer trains were not economically sound because they had a very serious adverse effect upon service and could discourage rail use in the long run. Another area considered in the study was that of the impact of labor costs upon rail economics. Using statistics developed by the Association of American Railroads, the study concluded that labor costs alone are not the biggest economic concern in rail line-haul operations. It was pointed out that while rail labor costs consume 51 percent of the rail revenue dollar, in line-haul rail operations, capital costs for equipment are far more significant. If true, this factor would wreak havoc upon the concept that long trains are more economical than short trains. The problem with making a broad statement that short trains are more economical than long trains is that depending on terrain, and other factors, the number of cars which maximize efficiency vary greatly. For example, a train consisting of 100 cars moving through the Rocky Mountains may be considered to be quite long, while the same number of cars moving through the Kansas plains may be considered to be quite short. Additionally, the concept of an economical short train may not be clearly evident. If only tangible factors are utilized, it would seem that short trains are quite clearly less profitable than long trains. This is because of the increased cost, labor and otherwise, which short trains may necessitate. The concept of economical short trains takes on meaning only when all the beneficial service and cost factors of short-train operations are understood.

The findings of two studies, a published report by the Massachusetts Institute of Technology,[20] and an unpublished report by an eastern railway, were summarized in the Leilich report, and are mentioned herein to indicate some of the major causes of delay in rail operations. According to the MIT study, they are: (1) burst air hoses, (2) sticking brakes, and (3) coupler failure. All three delay factors were far more prevalent in trains with 75 cars or more, hereinafter referred to as long trains, than in trains with less than 75 cars, hereinafter referred to as short trains. The eastern railroad study also indicated that long trains have a greater probability of derailment. Probable causes of derailment were broken into two areas: nontrack causes and track causes. The nontrack causes, length and weight of the train, indicated that long trains and heavier trains derailed more frequently than short trains and lighter trains. The study also showed that the severity of the derailment was greater as train length and weight increased. With regard to track-caused derailments, no significant relationship was found to exist between train length and track conditions. However, the severity of derailment usually increased with train length given equal track conditions. Another factor dealt with by the study was train separations caused by broken knuckles, broken drawbars, and uncoupling. Once again the probability of separation was shown to be greater for long trains than for short trains. The final area studied was schedule reliability. The study utilized performance data of an eastern railroad and reported that long trains required longer running times and deviated more from that railroad's established schedule standard than short trains.

---

[20] A. Long and R. Reid, *Railroad Car Movement Reliability: A Preliminary Study of Line Haul Operations* (Cambridge: Massachusetts Institue of Technology, 1970).

It is the occurrence of these delays which tend to diminish the quality of service and lead to the lack of dependability, a primary shipper complaint and a major factor shippers claim they utilize other modes, thus reducing rail revenue. If these delays could be avoided or minimized through the use of short trains, it would seem to follow that service would improve and shippers would be more inclined to utilize rail service. This additional utilization of rail facilities and minimization or avoidance of delays are two of the intangible factors which potentially make the operation of short trains more economical than long trains. The major factor is the cost elasticity of incremental levels of rail service. The railroads already know the margin between the price and cost of their service. If they could calculate the relationship between improved service and increased volume, they would then be able to formulate in real terms the value of short trains.

Several studies have been conducted recently by certain railroads. These studies indicate that the concept of short trains can be useful for certain types of service. For example, the Chicago &North Western (C&NW) has cut its average freight train length from 175 cars to 100 cars over the past 2 years. This action has made it possible for the railroad to provide better service to its shippers. Mr. James Wolfe, Vice President of Operations of C&NW, has stated, in an article appearing in *The Wall Street Journal* on January

11, 1975, that "[T]he effect is hard to measure precisely, but we know we have increased our share of the market."

The Illinois Central Gulf (ICG) proposed in 1972 a short-train experiment involving its Iowa division. However, the plan of operation which was developed from this study was never implemented, because the plan would have called for the relaxation of some work rules and the cutting of train crews from four to three men. The rail labor unions could not agree to such changes in working conditions and the railroad apparently did not pursue the issue.

It is this type of self-study and investigation which will eventually develop the improvements in rail service which is generally recognized as desirable and necessary.

LABOR-MANAGEMENT RELATIONS

The Coordinator holds the view that neither the present state of rail transportation service nor the prospect of improved service in the future can intelligently be considered without some reference being reflected in this report to the role played by railway labor and the impact on service of labor-management relations.[21]

In the preliminary report and order in Ex Parte No. 270 the Commission noted, at page 874 of 340 I.C.C., that it would not be propitious to include in the investigation of the railroad freight rate structure there undertaken the matter of recurring problems in the field of labor-management relations. Such relations unquestionably are outside the competence of the Commission to assess. Labor contracts, work rules, and wage levels, however, bear directly, significantly, and daily upon both the ability and willingness of railroad labor and management to conduct various essential operations. Ultimately, these cannot help but affect the provision and possible improvement of service.

While many reasons account for the final quality and cost of freight service rendered by the Nation's railroads, labor-management relations are one of the most important. Improving the current state of such relations should be a matter of high national priority.

The complex pattern of collective bargaining in the railroad industry frequently has caused the public to endure temporary

---

See, for example, the reference in respondents' second quarterly report to the fact that in the 3-month period covered by that report 12 railroads suffered interruptions in service as a result of major labor disputes.

hardships. That pattern has caused hardships of a more enduring nature. The Commission has no way to probe how deeply the matters shown on this record have been caused or affected by labor-management relations. Nor does it have the requisite jurisdiction to do so. Nevertheless, all indications are that there has been a significant impact. On July 10, 1973, for example, as a result of a labor-management agreement, the Congress authorized the Commission to allow railroads to raise their rates. Ex Parte No. 299, *Increases in Freight Rates and Charges—1973,* 346 I.C.C. 400, 350 I.C.C. 673.[22] The legislation was necessary under the circumstances, certainly, in order to enable railroads to offset increases they must pay in railroad retirement taxes pursuant to the agreement. When it is considered, however, that this is just the basis for one increase (fuel cost increases and inflationary pressures provide others) and that the main impetus behind the initiation of this and the other Ex Parte No. 270 proceedings was the vehemence with which shippers challenged rate increases proposed earlier by the railroads without having some assurance that the quality of service provided would improve, the factors that lay behind any such increases are extremely important.

Operating problems in railroad transportation always have involved train movements, time and track allocation, speed, safety, and the assembly of cars in such a way as to ensure their farthest movement without the need for disassembly. However, the distinct impression has been developed that there has been serious neglect of one of the most outstanding problems of all, that of management efficiently controlling or, perhaps, being able to control labor practices and costs.

The ever-increasing cost of labor and certain work rules, which with various other factors tend to counteract what otherwise could be real achievements in increasing productivity, has led, almost inevitably, to undue reductions in capital investments and increased operating expenses. As the unavoidable cost increases are encountered, management seems almost inevitably to cut back in its maintenance budgets. The problem of "deferred maintenance" is exacerbated. The repeated deferrals of maintenance outlays, in turn, have contributed to the present bad condition of cars, power equipment, and rights-of-way in many parts of the country, particularly in the Northeast. The resulting conditions then tend to create a spiraling situation in which labor costs move even further upward because trains must be operated at slower speeds.[23] When it also is realized that the part of the revenue dollar paid for labor generally is accepted to be about 50 percent,[24] the labor relations issue and the magnitude of its influence on adequacy of service and safety of operation is all the more apparent. Accordingly, the time appears to be ripe for an in-depth analysis.

---

[22] The provisions of Title II of the Railroad Rate Adjustment Act of 1973 (Public Law 93-69), added paragraph (4) to section 15a of the Interstate Commerce Act.

Not only is the need for labor-management cooperation well recognized, but a committee composed of labor unions and railroad presidents was formed to institute and propose solutions to major terminal problems. This committee instituted the St. Louis Terminal Project.[25] The Project Team of Labor/Management Task Force on Terminals (Project Team) selected the St. Louis terminal of the Missouri Pacific Railroad for testing innovative experiments in terminal operations. Since terminal operations are influenced by a wide range of labor agreements and practices, certain of the experiments conducted directly involved changes in labor agreements and practices.

In the St. Louis Terminal Project Report it was stated: "The experience of the St. Louis Terminal Project *** has demonstrated that labor and management can work together to improve operations and services."[26] Initial results indicate that operating practices and labor agreements can be changed to the benefit of labor, management, and customers. The Project Team found that:

> Labor has seen that a well-planned program of change in which it plays a vital role will not adversely affect the employees. The implementation of specific experiments has indicated to the men that their welfare is important and their interests are, in fact, taken into consideration in the planning of an experiment. They know that they can make a request to the Project Team for protection if their earnings are decreased before an experiment. [As of February 25, 1975,] payments of only $630 have been necessary to make the employees whole. As a result, the employees are beginning to realize that their cooperation is vital to the health of the railroad industry and certain changes are necessary for their increased prosperity. For example, a labor representative stated: "This is a start, a real start in the right direction to help us and our industry." This improved employee confidence in the program will make it

---

[23] It has been estimated, for example, that 6,900 miles of track of the Penn Central are in such an unsafe condition that trains can only travel at the rate of 10 miles per hour. A recent report of the House Interstate and Foreign Commerce Committee on H.R. 15223 (H. Rept. 93-1083) characterized this situation as being "worse than the Civil War era."

[24] Figures on file with the Commission indicate that labor's share of the revenue dollar was approximately 48 percent in 1972 and 52 percent in 1973.

[25] See *A Program of Experiments Involving Changes in Terminal Operations on the St. Louis Terminal Division Missouri Pacific Railroad—1974 Progress Report*, Project Team of Labor/Management Task Force on Terminals (1975) (hereinafter cited as St. Louis Terminal Project Report).

[26] St. Louis Terminal Project Report, *supra*, at page 18.

> possible to make greater progress toward a truly co-operative undertaking between labor and management.
>
> Management has received the economic benefits associated with the experiments and, in addition, has seen that a program of change, based on a quantitative evaluation of operations and developed jointly with labor, can produce improvements in operations that would not be possible otherwise. The Terminal Superintendent says that: "This program has enabled me to improve my operations and provide better service to shippers."[17]

Additionally, several experiments were completed that reportedly resulted in dramatic improvements in the movements of cars. For example:

> Requirements of labor agreements were temporarily waived to permit the overlapping of seniorirty districts so that Lesperance Yard crews could make transfers to the Ivory Yard. Previously, this work could only be performed by Ivory crews. Car movements were improved by at least 10hours/cars on a volume of about 200 cars/week.
>
> Another experiment involved the waiver of a 1940 agreement which allocated the MoPac yard-to-yard transfer runs across the Mississippi River to three crew districts on a percentage basis. The analysis of car movements clearly indicated that these river transfers should be made by the crew based at the yard where the traffic originates. Specific improvements in car movements could not be measured. The elimination of the confusion and dissension caused by the abolishment and reassignment of crews in order to balance the river transfer trips has a beneficial effect on operations. In addition, the clerical effort required to balance the trips is no longer necessary.
>
> [A further] improvement in operations resulted from the coordination of an interchange movement from the MoPac to the A&S and the modification of labor agreements involving the utilization of A&S crews. The blocking of the KG train at Kansas City was modified. A labor agreement was waived to permit an A&S crew to handle the interchange block immediately upon arrival in St. Louis. As a result, about 50 cars/day are now interchanged to the A&S 3-4 hours earlier than before. In addition, the movement of cars, bridged by the A&S from the MoPac at St. Louis to the C&EI at Mitchell was expedited.[18]

According to the Project Team, the experiments already implemented have not only improved operations but have raised the quality of service also. The Project Team reported that:

> Customers were asked to compare the quality of service they received before and after the experiments. They reported that cars now move to and from industries faster and more consistently. The following examples of written comments received from customers illustrate improvements in service:
>
> *Ecno Flo Bulk Flour—terminal transit times have been reduced;
>
> *Coca Cola—terminal service on inbound loads has improved considerably;
>
> *Stupp Brothers—improvement in terminal time on inbound loads, outbound loads are also moving much more expeditiously; and

---

[17] Id. at pages 18-19.

[18] Id. at pages 20-21.

> *Town House Furniture—no delays since the experiments started.[29]

The Project Team avers that employees are benefiting from improved service resulting from these experiments. Faster and more reliable movements of cars will help the railroads retain business. It was reported that:

> The program of experiments has had an indirect impact on the welfare of the employees. The improvements in operations have reduced yard congestion and simplified car movements. Employees are also benefiting from the improvements in service. The faster and more reliable movements of cars will help the railroads retain business that is threatened by other transportation modes and attract new business. Improved service, then, will result in more car movements, which in turn will create more jobs and improve job security. If the Mini-Piggy experiment is implemented, road crews will be provided with more desirable jobs.[30]

The Coordinator commends the Labor/Management Task Force on Terminals for the steps taken to improve service through the implementation of innovative labor practices. Experiments such as those conducted at the St. Louis terminal are being encouraged. The Commission will do all in its power to assist labor and management to improve rail transportation service.

OTHER FACTORS AFFECTING SERVICE

This report demonstrates: (1) that present rail freight service is inadequate; (2) that many interdependent factors contribute to respondents' ability, or lack of it, to provide adequate service; (3) that published freight service schedules have not been shown to be necessary; and (4) that a joint effort, conducted on several fronts and of a kind never before undertaken by the railroads, the shipping public, and the Government, will be needed if such service is to achieve an adequate level. In connection with the latter, however, the following additional comments are appropriate.

Some of the more troublesome practices in rail transportation that have come to the Commission's attention over the years involve demands for assigned and special cars, circuitous routing, abuses of the privilege to divert cars and reconsign shipments, and delays in providing billing and forwarding information to carriers. The general nature of these problems is described below. Patterns of activity reflected in them, however, cause the ultimate burden of responsibility for inadequate rail freight service to be shared by shippers, receivers, and respondents alike.

---

[29] Id. at pages 22-23.

[30] Id. at page 23.

Assigned and special cars.—The treatment accorded certain classes of freight or the freight of certain shippers through such devices as specially designed or specially equipped cars or the assignment of general purpose cars to certain shippers reflects, to some extent, the various ways and means by which the Nation's railroads seriously attempt to satisfy the broad spectrum of shippers' needs. The demands of certain shippers, however, as opposed to the needs of others, often reveal a desire for discriminatory, or at least preferred, treatment. Undue detention of assigned cars for certain shippers and the demands by them for the empty return of such cars clearly constitute another facet of the overall service inadequacy problem currently being experienced. Attention must be given by those who engage in such practices to the effect of what they really are doing. The uneconomical one-way haul which results from the existence of assigned and special cars should be eliminated so that the Nation's transportation resources can be put to full use. Therefore, shippers who utilize to their advantage assigned and special cars are encouraged to work together with the carriers involved in seeking ways of avoiding uneconomical one-way hauls.

Circuitous routing and diversion.—Under the provisions of section 15(8) of the act, when two or more through routes and through rates are established, a shipper has the right to designate in writing the route of his shipment. A railroad is obligated to comply with that routing. Obviously, however, if the route chosen by the shipper is circuitous, the capacity of the railroads involved to serve other shippers is reduced to the extent that the load-to-load cycle time of the car or cars involved is lengthened. The practice, therefore, ought to be critically examined by those who engage in it.

Little is known today about the extent to which this statutory right to route traffic is abused. It is apparent, however, that many shipments are deliberately routed over the more circuitous of available routes. It is known too that the practice, coupled with the privilege to divert or reconsign shipments, allows railroad cars to be used as rolling storage facilities while the involved shippers watch changing market conditions for the commodities they have shipped. Other shippers consequently are deprived of the potential use of such cars to meet their needs.

The Commission has addressed itself to the problem of route circuity in the past in certain so-called "Fourth Section

Applications."[11] In *Lumber from the South and Southwest*, 198 I.C.C. 753, the Commission stated:

> Transportation service performed over grossly circuitous routes, when numerous shorter routes are available, is a wasteful use of existing facilities. It is therefore necessary and desirable, in the public interest, to place reasonable restrictions upon the use of uneconomical routes, which entails a greater and more expensive service. [P. 776.]

The restrictions referred to in that case, beyond which the exemption from section 4 would not apply, ranged from 133 1/3 percent to 170 percent of the shortest distance possible.

More than ever, excessive route circuity should be avoided because of its effect upon efficient utilization of equipment. This should be an area of concern to both shippers and carriers, for both will benefit. The time has come to begin to question the statute which gives the shippers unrestrained routing rights. In view of the Nation's energy posture and the need for efficient operation, it is recommended that the Commission direct a staff study on this issue.

Billing and forwarding information.—Another abusive practice known to exist is that of shippers failing to promptly provide, or deliberately withholding, sufficient information on a shipment which would enable the railroad to which it is tendered, to forward it and to issue its bill for transportation charges. This practice extends the load-to-load cycle of the car involved by unnecessarily delaying its departure from origin. The practice is detrimental to the public interest, interferes with the financial resources of the railroads involved, and tends to circumvent our credit regulations. The Uniform Freight Classification provides rules in this regard, but those rules apparently are not being followed in all instances. All of these practices contribute to the present inadequacy of service. They represent additional burdens on the railroad industry which already is overburdened.

SUMMATION

Before concluding this report, it is important to emphasize that the criticisms contained herein are offered in a constructive sense.

---

[11] Section 4 of the act reads in part: "It shall be unlawful for any common carrier *** to charge or receive any greater compensation in the aggregate for the transportation of passengers, or *** of property, for a shorter than for a longer distance over the same line or route in the same direction *** *Provided further*, that any such carrier or carriers operating over a circuitous line or route may *** meet the charges of such carrier or carriers of the same type operating over a more direct line or route, to or from the competitive points. ***

It is hoped that the report will aid in the ultimate provision of adequate rail freight service which, as seen, is the end product of a most complex system. Recognizing that it is difficult to compact into any discussion of such service the interrelationship of all of its many elements, this report has attempted to examine the main features of what has gone wrong and why. The conclusion to be drawn from that examination is that the quality of service currently provided by the Nation's railroads as a whole is in need of significant improvement, and that despite the financial condition of many railroads they are now capable of improving the efficiency of their operations and the adequacy of their service. Their capabilities may be greatly enhanced by the enactment of the RRRRA.

This report has attempted to establish the machinery necessary to improve service quality within the present sphere of railroad capacity, has formulated a number of related questions and laid the foundation for finding answers to them in the future. Answers do exist for the many unresolved service problems documented herein and, with the exception of those relating to labor-management relations, the Commission stands at the center of Federal policymaking efforts to foster programs and procedures to find those answers.

This report has set forth suggestions which are believed to be both pragmatic and provident. The intent of the suggestions is to recognize the causes of many of the problems and the effects thereof on both railroads and those whom they serve; establish a point at which rail freight service will be considered unacceptable should it tend to deteriorate further; and provide a base upon which a freight car management system can be established and from which the Commission can exercise more fully its existing statutory powers.

ULTIMATE FINDINGS

The Coordinator finds:

(1) That the Interstate Commerce Commission has jurisdiction under section 1 (particularly subsections (4), (10), (11), (13), (14), (15), and (21), 12(1), 13, 15, and 15a of the Interstate Commerce Act, and the provisions of the national transportation policy (49 U.S.C. preceding §1), to conduct the investigation undertaken herein into deficiencies in rail freight service and to make appropriate findings thereon;

(2) That freight service provided by railroads subject to the part 1 of the Interstate Commerce Act is not sufficient to meet the demands of shippers to the extent set forth in this report and that recommendations made with respect to improving that service are reasonable, necessary, otherwise lawful, and required in the public interest;

(3) That each railroad subject to part 1 of the Interstate Commerce Act should be requested to prepare and publish service schedules as described in this report;

(4) That schedules for the movement of empty cars are not required at this time;

(5) That the nature, scope, and cost of the continuing data needs of the Commission with respect to railroad freight service must be greatly extended and additional appropriations should be sought to enable the collection of sufficient information to permit more affirmative action by this Commission, particularly in light of the parties' inability or unwillingness to provide the requisite information;

(6) That the proposal urging the Commission to adopt a plan of reciprocal demurrage as described in the report herein should be rejected;

(7) That the proposal that the Commission further define the term "reasonable dispatch" insofar as it pertains to the transportation of nonperishable property by railroads subject to part 1 of the Interstate Commerce Act should be deferred until Ex Parte No. 284 has been finally resolved;

(8) That the proposal that the Commission establish an alternative rate structure under which standards of performance would be governed by the legal consideration of "reasonable dispatch" with respect to normal service and that a higher level of rates be authorized for service performance of a higher quality as determined by controlled standards achievable by efficiently operated railroads should be rejected;

(9) That the proposal that each railroad subject to part I of the Interstate Commerce Act should be required to prepare and file with the Commission schedules pertaining to terminal operations as set forth in this report, should be the subject of a rulemaking proceeding;

(10) That the proposal that a certain proportion of funds derived from future rate increases should be earmarked, allocated, and expended for the purpose of improving the supply and condition of

equipment of railroads subject to part I of the Interstate Commerce Act should be rejected pending final determination of the Commission's jurisdiction in the courts;

(11) That discontinuance of the program for filing service complaint reports (form BOp 105) is warranted;

(12) That proposals that the Commission sponsor shipper-carrier conferences to assure the interchange of information with respect to rail freight service and the quality of it should be deferred subject to the qualifications set forth in this report;

(13) That the areas of (a) contract rates for rail service, (b) assigned and special car allocation, (c) circuitous routing of freight cars, (d) billing and forwarding information, (e) demurrage and free-time allowances, (f) electrification of rail lines, and (g) the utilization of "short train" are currently under study in other proceedings or are recommended for continued monitoring or study for possible future corrective action, as shown to be necessary;

(14) That this report does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969.

It is ordered, That this subnumbered proceeding be, and it is hereby, closed.

APPENDIX A

Part I—Identities of the parties

A. Shippers and shippers organizations.
  Archer Daniels Midland Company
  The Board of Trade of the City of Chicago
  The Board of Trade of Kansas City, Mo.
  Boise Cascade Corporation
  California Grape & Tree Fruit League
  Capital Steel Corporation
  CF Industries, Inc.
  Construction Aggregate Rail Shipper Conference
  The Drug and Toilet Preparation Traffic Conference
  Far-Mar-Company, Inc.
  The Fertilizer Institute
  Garvey, Inc.
  General Foods Corporation
  General Mills, Inc.

Georgia-Pacific Corporation
Glass Container Manufacturers Institute, Inc.
Geo. A. Hormel & Co. (joined by John Morrell & Co., Oscar Mayer & Co., and The Rath Packing Co.)
Manufacturing Chemists Association
Monsanto Company
National Association of Secondary Material Industries, Inc.
National Grain & Feed Association (joined by Minneapolis Grain Exchange and Producers Grain Corporation)
Proctor & Gamble Company
Quaker Oats Company
Reynolds Metals Company
Southwestern Poultry & Egg Association
Southwest Oregon Shippers' Traffic Association, Inc.
The Toledo Edison Company
U. S. Plywood-Champion Papers, Inc.
Weyerhaeuser Company

B. Respondents and carrier associations.
Association of American Railroads
The Atchison, Topeka and Santa Fe Railway Company
Burlington Northern, Inc.
Chesapeake and Ohio/Baltimore and Ohio Railroads
Penn Central Transportation Company
Seaboard Coast Line Railroad Company
Southern Pacific Transportation Company
Southern Railway System
St. Louis-San Francisco Railway Company
Union Pacific Railroad Company

C. Governmental agencies.
United States Department of Transportation
General Services Administration
New York State Department of Transportation

Part II—Position of the Parties

A. INITIAL REPRESENTATIONS

1. *Archer Daniels Midland Company* of Decatur, Ill., is a multiplant agri-business engaged in the procurement and processing of grains and soybeans for distribution in domestic and world markets. It urges this Commission to establish definite legal guidelines as to the reasonableness of general freight car service. It suggests that carriers be required to place loaded or empty equipment into road-haul or switching service in no less time than the free time allowed shippers to load or unload the same equipment; and that shippers should be entitled to recover special damages for losses occuring thereafter due to increased costs or market reductions, with the burden of proof being on shippers to prove these damages. Also, it recommends that freight schedules be published similar to those appearing in the *Official Guide of the Railways*.

2. *The Board of Trade of the City of Chicago* is a corporation which maintains a commodity exchange whose members engage in the daily buying and selling of grain, grain products, and other commodities. Among its members are storage operators,

grain merchandisers, processors, and exporters who operate and maintain facilities within the switching limits of Chicago and who utilize railroad transportation to a great extent in shipping and receiving grain products in interstate and foreign commerce. It lists erratic and excessive transit times, terminal delays, and improper switching involving both carrier and privately owned or leased equipment, as representative complaints registered by shippers and receivers of grain. It suggests that railroads establish and perform over-the-road freight service predicated upon published schedules; that such rail carriers should be required to place, remove, or forward loaded or empty cars within a 24-hour period at point of unloading, loading, or interchange, exclusive of Saturdays, Sundays, or holidays; and that movements within terminals, such as to or from holding tracks, would also be subject to a 24-hour limitation in each direction. Failure to meet established standards of overall service should, it is argued, subject the carrier to an appropriate penalty or charge to be fixed by this Commission on the order of the graduated demurrage scale presently in effect.

3. ***The Board of Trade of Kansas City, Mo.*** (Board), asserts that the most critical problem of rail service is that of terminal service and the allied delays related thereto. The Board urges this Commission to conduct a thorough investigation of in-terminal operations. More specifically, it requests that a determination be made of rail practices regarding (1) in-terminal switching operations, (2) interchange procedures between carriers when cars are merely passing through a terminal, (3) factors determining which cars are left at terminals when more tonnage than a train can haul has been tendered, and (4) factors determining when a second unit of a certain train will be run.

4. ***Boise Cascade Corporation*** of Boise, Idaho, contends that the preparation of The Railroad Freight Service Report, Form BOp-105, is too burdensome, and that the use of this form will merely quantify the obvious and divert this Commission's staff from the performance of more important duties to what is largely a clerical function. It claims that data will show that an inordinate number of cars are unsuited either by size or general condition for use; that at predictable times of the year certain types of cars are not available in sufficient quantities to meet the demand; and that through certain congested terminals and interchanges cars are held for unreasonable periods of time. It proposes a system whereby, on a preselected sample basis, either a punch card or form be filled out by the originating shipper that would show: (1) the condition of car, (2) the number of days delay in furnishing the car after request, (3) the carrier, (4) origin and destination, and (5) date of release. This form would travel with the waybill, and at destination either the carrier or the receiver would complete the form, acknowledging the date received and forwarding it to this Commission. It contends that its proposal would provide an economical method of locating trouble spots in railway system operations.

5. ***California Grape & Tree Fruit League*** (League), of San Francisco, Calif., is an association which represents growers and shippers of grapes, berries, and deciduous tree fruits in California. Its members produce about 80 percent of those commodities moving from California. Because of the highly perishable nature of the commodities, any delay in transit reduces their shelf life and, therefore, lowers their market value. The League states that rail shipments have been arriving in New York any time from the 8th morning to the 15th morning after leaving California. Motor common carrier service, on the other hand, now offers delivery within 72 hours. As the result of deteriorating rail service, which it attributes to the railroads' complete indifference to the needs of their shippers and rising freight rates, the League's competitive stance in

distant markets is jeopardized. It urges the formulation of guaranteed delivery schedules assertedly needed for the orderly making of California fruits at Eastern destinations. It contends that the only explanation for the poor delivery schedules from Chicago to New York is poor railroad management; and that "unit-train" service would restore reliable delivery schedules, reduce transit times between California and eastern destinations, and result in better utilization of rail equipment.

6. *Capital Steel Corporation* (Capital) of Jersey City, N.J., is engaged in the fabrication of reinforcing steel bars at Jersey City, and Baltimore, Md. Each plant receives from 250 to 350 carloads of steel bars a year. No cars are required for outbound movments. Erratic schedules are said to be a major service deficiency, though it does not feel printed schedules would be practical. This is allegedly due primarily to the delays which result from the tendering of defective cars by the originating carrier. It asserts that originating carriers should be held responsible for providing usable cars because shippers are not subject to this Commission's service rules nor are they qualified to inspect cars before loading. This would eliminate many delays that result from diverting loaded cars to repair shops while en route. Also, service assertedly could be improved by increasing the number of runthrough trains and adequately staffing terminal and interchange stations during weekends. Finally, it is Capital's contention that the 24-hour period for interchange is overstated and unduly extends the transit time and should, therefore, be shortened.

7. *CF Industries, Inc.* (CF), of Chicago, Ill., manufactures and distributes agricultural chemical fertilizers to its owners, namely 18 farm cooperatives with receiving facilities in 43 States and the Province of Ontario, Canada. CF relies on the railroads to transport more than 3 million tons of fertilizer each year for ultimate delivery to over 2 million farms. Because it is in a seasonal business, shipper regularly experiences car shortages in the fall and in the spring. Even in nonseasonal periods, however, the car supply is characterized as erratic due to irregular switching schedules and the rejection by CF of up to 15 percent of the cars tendered by named railroads on the ground that such cars were unacceptable for loading. Shipper suggests that a demurrage-type penalty be assessed on the carrier for cars held in any yard for more than 24 or 36 hours, except where the following movement is made in a service that is not normally provided on a daily basis. A demurrage credit is suggested for delays caused by the tendering of defective cars. Finally, in lieu of what it regards as the lengthy form BOp-105, CF recommends that a monthly form for a specific test period be filed with this Commission covering specific service areas such as transit time, plant switching, terminal delay, car shortage, unsuitable equipment, and carrier service complaints. It believes that this would enable this Commission to combine data by month, region, and type of occurrence and provide a basis for meaningful review.

8. *Construction Aggregate Rail Shipper Conference* (Conference) is an organization consisting of 43 producers of aggregate and formed for the purpose, among others, of promoting that railroad service which best meets the needs of its members. Aggregates are used as a material in highway construction or concrete work, and the primary transportation need of the aggregate industry is reliability of rail service, rather than speed in transit. Once a reliable transit time is known, shipping dates can be readily adjusted to the customer's requirements. Bunching of cars is a major problem according to the Conference. It urges that freight train schedules be established and terminal operations controlled, to the end that a shipper consistently will know the time-in-transit and the receiver can schedule production. It believes that this would provide carriers with improved utilization of equipment. The

Conference also represents that different performance standards will have to be established for line-haul and terminal operations. It goes on to suggest that deviations from the schedules could be discussed between carriers and shippers/receivers at meetings of Shipper Advisory Boards or similar type organizations. It believes that in this way schedule changes might be handled in much the same cooperative way as tariff bureaus now process rate proposals. Thus, according to the Conference, day-to-day adjustments could be routinely settled, while only major problems will be required to be submitted to this Commission for resolution.

9. *The United States Department of Transportation* (Department) favors a market determination of adequate service where alternative, effective service exists. It is the Department's belief that the adoption of a bill, "Transportation Regulatory Modernization Act of 1971," which it has sponsored, will produce an environment conducive to ratemaking more closely based on costs than the current regulatory structure. It represents that giving carriers pricing flexibility within a "zone of reasonableness" to meet competition from other modes will in turn compel and allow carriers to respond appropriately to demands for varying kinds and qualities of service presented by shippers with differing needs. The Department believes that before service guidelines, service standards, and controls can be developed, additional information in the form of sound research and analysis of the railroad rate structure, revenue needs, and shipper needs, costs, and services is required. It is convinced, however, that such studies will demonstrate the soundness of its "zone of reasonableness" pricing concept.

10. *The Drug and Toilet Preparation Traffic Conference* (Conference) is an association of 130 shippers of drugs, medicines, and toilet preparations. Carload service is used both for the receipt of materials and supplies and the shipment of finished goods to storage or distribution centers. It contends that, while fast service is desirable, a service performed with reliability and compatibility with preplanned inventory levels would serve the industry's basic rail needs. The Conference suggests that as the railroads are most knowledgeable of their own capabilities to provide the appropriate services, guidelines relating to the quality of freight services should be, at least initially, established by the railroads themselves. Based on such standards, with a reasonable degree of tolerance, the railroads can then be held accountable to this Commission by being required to report each service failure consistent with reporting requirements that may be propounded, such as under sections 1(15), (16), and(17) of the Interstate Commerce Act. The service regulations can, it is argued, be self-policing. Should service failures continue to arise, however, and not be corrected voluntarily upon complaint, this Commission can investigate and then make recommendations or issue appropriate orders that would correct the situation.

11. *Far-Mar-Company, Inc.* (Far-Mar-Co), of Hutchinson, Kans., is engaged in the handling, storage, and merchandising of grain for its members located in Iowa, Colorado, Kansas, Missouri, Nebraska, and Wyoming. It owns and operates 12 terminal and subterminal elevators with a total storage capacity of nearly 100 million bushels of grain. Far-Mar-Co and its members rely upon the railroads to furnish a transportation service that is adequate and sufficient to maintain their grain elevators. The alleged mishandling of its private cars by the railroads is a major complaint. It is, therefore, in the area of terminal services where this shipper feels that this Commission should throughly investigate. To illustrate irregular terminal operations, it states that 3 to 5 days are required to move its cars out of certain terminals, whereas in other areas its grain shipments move forward the next day after the complete billing instructions are surrendered to the particular railroad involved.

12. *The Fertilizer Institute* (Institute) of Washington, D.C., is a trade association of 230 member companies which manufactures a substantial portion of the fertilizer used domestically. Among the complaints registered by the Institute are erratic transit times, excessive turnaround times for leased or privately owned cars, cars tendered which are unfit for loading, delays caused by the loss of waybills, and car shortages generated by excessive repair times. Consistency of service, which is the factor shippers consider most important, is said to be lacking in present-day rail service. It argues that service should be deemed to be "on time" if car arrival at destination is within 24 hours of published schedules. The Institute urges (1) that future rate increases be conditioned upon a given ratio of the proceeds being allocated to equipment improvement; (2) that the failure of the railroads to meet published norms would be considered to constitute prima facie evidence of violations of sections 1(4) and (11) of the act with reparation or liquidated damages recoverable by the shipper, and (3) that this Commission establish specific penalties, which would comport generally with the historical out-of-pocket losses suffered as a result of service failures, or, in the alternative, an effective administrative procedure whereby shippers would be able to recover their actual damages, without administrative delay or legal and accounting expenses that exceed the amount sought. It asserts that these proposals would result in better utilization of equipment, improved service to shippers, and more profits to the railroads.

13. *Garvey, Inc.* (Garvey), of Wichita, Kans., filed a statement on behalf of C-G-F Grain Company, Inc., of Topeka, Kans., Garvey Elevators, Inc., of Fort Worth, Tex., Garvey Grain, Inc., of Wichita, Kans., and Lincoln Grain, Inc., of Atchinson, Kans. Garvey and its members named above are engaged in the storage, merchandising, and handling of grain and allied products. They operate 71 grain elevators having a total capacity of over 209 million bushels, as well as other farm facilities at points throughout the Midwest and the Plains States. The quality of rail service is of vital importance to Garvey because of the large volume of its traffic which moves from country elevators to subterminal and terminal markets. It suggests that appropriate standards be established in the freight service areas of (1) switching, (2) inbound carload movements, (3) outbound carload movements, (4) furnishing of empty suitable equipment, and (5) supply of equipment. In this regard, it avers that adequate switch engines and crews should be available to effect the movement to and from a facility based on the amount of business performed at that facility. It also contends that the bunching and blocking of terminals, which causes confusion in the movement of inbound cars, should be alleviated. Finally, Garvey urges that the standards of service (*e.g.*, schedules) established by the Commission in this proceeding be elevated to, and, therefore, have the force and effect of, tariff law. Damages from failures of service would then be recoverable by a shipper in an appropriate action against the involved carrier. It asserts that shippers are presently penalized for demurrage when service is inferior, and that penalties for poor service which are imposed by the AAR do not adequately compensate shippers.

14. *General Foods Corporation* (General Foods) of White Plains, N.Y., is engaged in the manufacture and distribution of nationally known grocery products, both dry and frozen. Its numerous distribution centers are purposefully located near major metropolitan areas in order that key markets may be served promptly with mixed carloads of combined products manufactured at widely scattered plants. As the freshness of food products is directly related to the ability of such centers to restock promptly, fast and dependable rail service is vital to General Foods, and poor transportation service often completely frustrates all planning for supply and sale of

goods. It asserts that service must be a constant consideration and its dependability should be judged on adherence to arrival schedules; and that dependable schedules should be developed by the railroads which can be met at least 90 percent of the time. Where through routes are involved, General Foods suggests that definite reasonable timetables be established so that the interchange of cars between railroads can be realistically planned and regularly followed. It recommends that schedules not be published in tariffs, but rather than schedule publication in the Official Guide of the Railways would be sufficient and, at the same time, less costly and burdensome. Change in such schedules should, it is contended, be made only after proper notice to all concerned at least 30 days prior to their effectiveness. It believes that when for uncontrollable reasons schedules cannot be met, shippers with cars en route should be notified by the carrier of the reasons for the delay and when delivery can be made. Better performance would assertedly result in greater utilization of existing equipment. General Foods recommends that this Commission's involvement should occur only in exceptional cases which are not susceptible of correction between the railroads and their customers.

15. *General Mills, Inc.* (General Mills), submitted a comprehensive statement generally characterizing existing railroad freight service as erratic, slow, and unreliable. These faults are said to be manifested in such ways as unavailable or inadequate car service, delays in placing cars for loading or unloading and dispatch, and irregularity in delivery resulting in the "bunching" of cars. According to this shipper, the quality of rail service has steadily worsened over the years. It hopes that out of this proceeding will come a restructuring of rail rates which would include standards or guidelines for reliable and predictable service to which railroads would be required to adhere. It argues that merely moving a carload of freight does not fulfill a carrier's obligation to a shipper; and that, instead, the car must arrive within a time frame in which the lading is scheduled as an input into a marketing, production, or other context in lieu of merely being at destination.

It contends that the decisionmaking process in the railroad industry fails to take into consideration the elasticity of demand or how the service demands of shippers react to the quality of service. Performance standards assertedly are needed so that such quality can be measured and controlled. General Mills asserts that existing procedures and remedies regarding rail service, such as those appearing in sections 1(4), 1(6), 1(15), 1(16), 1(17), and 20(11) of the Interstate Commerce Act, entail a costly and lengthy process of negotiation or litigation to obtain redress; that even in those instances where some redress can be obtained through the payment of monetary damages, such damages are sufficient to cover the full economic costs to the shipper; and that a continuation of what it terms this Commission's historical policy of considering rates as wholly separate and apart from service reliability and quality provide no incentives for either the railroads or their customers to improve the total revenue-generating capability of the rate structure by adopting more efficient modes of operation.

In the past, General Mills has attempted objectively to measure rail service based on an arrival target of a 3-day span plus the normal switching and en route transit times. By applying this standard of performance to its shipping records, it asserts that only 65 to 72 percent of its rail shipments arrived "on time" between 1964 and 1966; that from 1966 to 1970 the railroad's performance measured 66 percent, and that in 1971 this was down to 65 percent. It believes, however, that such a standard is not an entirely satisfactory solution to the service problem because the ascertainment of both liability and damages would still entail a costly and lengthy process of negotiation and litigation.

It urges the adopotion of an entirely new and different approach in relating rates to service with emphasis on managements' ability to control quality in the movement and utilization of freight cars. General Mills also calls for the use of economic incentives to reflect the quality of service provided. In this regard, two plans are submitted for this Commission's consideration: The first plan would require the publication of alternative rate strucutres for the same service route. Basically, the lower rate structure would be the present rates charged with standards of performance being governed by present legal considerations of "reasonable dispatch." The higher rates would be based upon controlled standards deemed to be within the reach of an efficiently operated railroad. Thus, a failure to meet such controlled in-transit norms without justification (such justification being limited to matters beyond the control of the participating carriers such as acts of God, acts of public authority, or default of the shipper) would result in damages being automatically deducted or set off by the shipper to the level of the lower rate structure. It advocates this as an exclusive remedy and, in effect, shippers would (with certain limited exceptions) forfeit all other rights of redress presently available.

General Mills' second plan calls for one basic rate structure which is explicitly tied to controlled in-transit times. Failure to meet these schedules, within an allowable tolerance and subject to acts of God or public officials, would bring into effect automatic deductions from the freight bill for each day of delay. Such deductions would be expressed either as dollar amounts or as percentages of the going rate and would be exclusive of all other legal remedies for damages due to delay. The amount of recovery by shippers could, however, in no event exceed the total amount of the freight charge.

General Mills believes there is nothing in the existing provisions of the Interstate Commerce Act or other laws administered by this Commission to preclude the adoption of either plan 1 or plan 2. According to this shipper, the issue is simply one of close analysis of the relevant economic and statistical data, and of carefully and plainly drawn tariffs in order to obviate any possible violations of such provisions as sections 1(5), 1(6), 2, 6, 10, and 20(11) of the act, and sections 1 and 2 of the Elkins Act. It is asserted that under either of its proposals, disputes can be quickly settled or altogether avoided within the structure of published schedules and rates; and that such proposals do no more harm than explicitly incorporate two historically sanctioned principles of contract law—"time is of the essence" and liquidated damages—into the transportation contract for carriage.

The purpose of General Mills' two-part proposal is to compensate for losses due to delay where proof is difficult, in addition to providing incentives for improved service. The moving force behind its plan is having carriers' revenues, and consequently their earnings, depend upon the quality of service they provide.

In order to implement its proposals General Mills suggests that the following steps be taken: (1) pending the development of adequate information and experience, the proposals should, initially, be optional with the railroads; (2) this Commission should issue a broad and general statement of policy indicating that, in its opinion, rail freight tariffs containing features similar or identical to the two proposed plans are not *per se* illegal under any provision of existing law, and that this Commission encourages the filing of such tariffs and will evaluate them as to their lawfulness on the same basis as any other tariff filed with it; (3) to facilitate the filing of such tariffs, this Commission should promptly examine the provisions of Tariff Circular 20 for any possible impediments and make such modifications as may be required through either appropriate special permission orders or changes in the tariff rules; (4) carriers choosing to adopt these proposals in whole or in part should be required to evaluate their effect as to (a) shipper acceptance and use, (b) effect on service reliability, and (c) increases or reduction in claims paid; (5) in light of these reports and other relevant information, this Commission should state that it will consider the feasibility of making them mandatory for all freight traffic or significant portions thereof.

In conclusion, General Mills represents that acceptance by this Commission of the basic principles outlined in its statement, and strong and positive encouragement of their use by the railroads, would result in better service through the economic incentives of the pricing system.

16. *The General Services Administration* (GSA) represents the civilian executive agencies of the United States in their interests as substantial users of rail transportation services. GSA believes that the form BOp-105 procedure offers a timely opportunity to compile a systematic data base which may permit the development of objective measures of railroad service quality. It has requested, however, that the record in this proceeding be held open until substantive data and appropriate guidelines and standards can be developed by its staff from copies of the completed forms, together with copies of such replies as are filed by the railroads.

17. *Georgia Pacific Corporation* (GP) of Portland, Oreg., is a substantial manufacturer and distributor of building and forest products. It ships about 450 carloads of freight a day and its annual freight car requirements exceed 150,000 cars. Because many of its mills are wholly dependent on rail transportation and such carriage is the only practical way to transport many of its products, GP has a vital stake in the development of efficient and dependable rail transportation service. This shipper argues that regulated rail carriers should be required to establish and publish schedules for both terminal-to-terminal trains and in-terminal operations. Standards for in-terminal operations are the most important, according to GP, because cars have been delayed or lost for days, or even months, in railroad terminals. It suggests that 24 hours be established as a standard, and that consolidated weekly reports of the in-terminal delays, then be forwarded to regional ICC officers.

GP recommends that terminal-to-terminal performance be measured by using published schedules and a sliding-scale grade system. For example, trains traveling between terminals and arriving within 1 hour of the published schedule would be graded 100. The grade would decrease by 10 points for each successive 4-hour delay.

In order to maintain and improve performance, GP suggests that this Commission publish individual railroad performance records for public distribution on a quarterly basis. Publication of this information would provide shippers with service information not now available.

18. *Glass Container Manufacturers Institute, Inc.* (Institute), is composed of 25 glass container manufacturers which produce over 90 percent of the glass containers made in the United States. About 85 percent of its members' raw materials are received by rail. Because it is a long and costly process to shut down and restart a glass furnace, the production of glass containers is a continuous process. Thus, it is essential that a constant, regular supply of raw materials be available. The Institute characterizes the railroads' performance to date as "exceedingly poor" because service has been neither rapid, efficient, nor consistent. Based on a 3-month study period in 1968, it concludes that actual transit-car days exceed normal transit-car days by an average of 59 percent. The accumulation of this large number of excess transit-car days contributes greatly to bunching at destination and considerably reduces car utilization, according to the Institute. Thus, it maintains that railroads have usually failed to operate in a manner which they have demonstrated from time to time to be

genuinely possible. It recommends that quality of service be measured against a railroad's efficiency and consistency in achieving its best performance and not its worst. It suggests that in this manner the perennial problems of car shortages and poor car distribution, which are further aggravated by seasonal demands and which have grown to be problems of national scope, can be solved. It believes also that 90 percent compliance would be reasonable to expect, and that the inability of carrier management to measure up to predetermined standards should be open to public view.

The Institute urges that each rail carrier be required to publish and file with this Commission thus making available to the public time schedules for over-the-road service and reasonable time limits for switching and terminal services. Because of the general shortage in cars, a review of standards relating to per diem charges is also recommended, with a view toward providing incentives for repairing and upgrading cars, bettering car utilization, and motivating carriers to increase the national car fleet. Also, it avers that the tendency of railroads to operate longer trains should be investigated as a possible factor contributing to freight delays, bunching of cars, and erratic service in general.

The Institute supports a procedure whereby service failure complaints may be lodged directly with the carrier involved. If the problem is not corrected within a specified time, and after the ICC regional director has consulted with the carrier, this Commission should be empowered to issue an appropriate order directing that the service deficiency be remedied. The Institute believes that to the extent this Commission does not have the power to require and enforce compliance with service standards, legislation should be enacted to confer such jurisdiction.

19. *Geo. A. Hormel & Co.* of Austin, Minn., *John Morrell & Co.* of Chicago, Ill., *Oscar Mayer & Co.* Madison, Wisc., and *The Rath Packing Company* of Waterloo, Iowa (Hormel, et al.), jointly filed a statement highly critical of the efforts in this proceeding to date. They state that the most effective control to improve and maintain performance standards would be the conditioning of rail rate increase upon the carrier's meeting established service standards. These meatpackers argue that because of its expertise on the matter the Commission, not the individual rail shipper, should bear the investigatory burden; that the recordkeeping involved in preparing, compiling, forwarding, and following up on the service report is unduly burdensome for shippers; and that the effort expanded would not result in any improvement in freight service. They argue that unless this Commission adopts a new approach in seeking a solution to this perennial problem, this proceeding will follow the pattern set in the past and the problem will continue to plague shippers. In conclusion, Hormel, et al., request that the instant proceeding be discontinued, and that there be instituted a new proceeding based on concrete proposals aimed at definitively solving the problem associated with rail freight service.

20. *Manufacturing Chemists Association* (Association) of Washington, D.C., is a trade association of 165 member companies which account for over 90 percent of the industrial chemical production in the United States. In addition to the extensive use of box cars, its member companies provide about 40 percent of the private tank car fleet for the movement of industrial chemicals. The Association urges the establishment, after thorough investigation, of reasonable minimum and maximum time limitations and quality of performance requirements for each element of railroad freight service, including, but not limited to: (a) pickup at industrial plants, (b) switching, (c) terminal handling, (d) line haul, (e) accessorial services, (f) car inspection and repair, (g) delivery to industrial plants, and (h) availability of transportation equipment. It deems

as essential the development of service guidelines, service consistency, and a definite interpretation of "reasonable service." The establishment of practical and achievable standards which meet the reasonableness test should, it requests, be accomplished in this proceeding. Also, it recommends the adoption by all railroads of a standard reporting system as to movement and car location, and the establishment of freight schedules with penalties and assessments similar to demurrage charges for delays.

21. *Monsanto Company* (Monsanto) of St. Louis, Mo., is engaged in the production of chemicals, plastics, petroleum products, manmade fibers, and electronic products. Monsanto uses most of the Nation's railroads in the distribution of its raw materials and finished goods. It advocates the defining of "reasonable dispatch" in order to fix standards that are practical and reasonable, and the assessment of expensive penalties for the railroad's failure to meet established freight schedules. Such a provision would allow, for example, 2 free days beyond the established standard, then assessing $10 a day for the next 2, $20 a day for the next 2, and $30 a day for any additional delay. It contends that liability for service penalties should be imposed on all participating railroads on a given shipment with payment to be made to the shipper by the participating carriers according to fault; and that similar charges should be assessed for service failures on the empty return of privately owned equipment. It believes that these proposals will improve service reliability and equipment utilization.

22. *National Association of Secondary Material Industries, Inc.* (NASMI), of New York, N.Y., represents over 700 member firms including shippers, receivers, processors, brokers, and consumers of secondary materials. Members ship in excess of 200,000 carloads of nonferrous metal scrap, paper waste, and textile waste annually. It is suggested that the railroads develop firm and realistic rail schedules and publish these in *The Official Guide of Railways*. The Association calls for a clear legal definition of what constitutes "reasonable dispatch," and states that service standards should include a schedule for the time required for carriers to place loaded or empty equipment into road-haul or switch service. It also recommends this Commission's sponsorship of shipper/carrier conferences to assure complete interchange and understanding of types of information involving car tracing, expediting, scheduling, and reporting. Lastly, NASMI cautions that whatever course of action is chosen should include strict enforcement measures to ensure compliance.

23. *National Grain & Feed Association* (NGFA) of Washington, D.C., filed an initial statement with which *Minneapolis Grain Exchange* of Minneapolis, Minn., and *Producers Grain Corporation* of Amarillo, Tex., concur. NGFA is a nationwide association with 49 affiliates, which in turn represent over 12,000 grain, feed, and processing firms throughout the United States. The Association asserts that the principle source of rail freight delay occurs at terminals, interchanges, and internal junction points.

Rather than recommend that each carrier be compelled to initiate and maintain strict freight schedules, it believes that rail service can best be improved by the less complex alternative of investigating and forwarding standards for controls in terminal operations and establishing minimal acceptable freight service. NGFA contends that the Commission's effort with respect to its service orders program has been notable, but that the orders have not been self-policing; and that railroads generally adopted the attitude that a civil penalty was a remote possibility at best. In the event a penalty was imposed it is treated as an ordinary expense of doing business.

NGFA proposes that this Commission order that the following comprehensive operating standards and rules be published in the Uniform Freight Classification:

(1) Outbound loaded freight cars must be removed from the point of loading interchange tracks of industrial plants within 24 hours, exclusive of Sundays and holidays, following acceptance of carrier by the shipping instructions covering the movement of such cars into road service or to a connecting line when such connection is required by the billed route. An additional 24 hours, exclusive of Sundays and holidays, shall be allowed to a connecting line(s) to move such cars through the origin terminal for movement in road service pursuant to the billed route.

A total of not more than 48 hours, exclusive of Sundays and holidays, shall be allowed from acceptance by carrier of shipping instructions for moving such cars through the origin terminal into road service where two or more connecting carriers at such origin terminal are involved.

(2) Where loaded freight cars are delivered by one carrier to another carrier at an intermediate interchange point, such interchange must be accomplished within 24 hours after arrival of such cars at the interchange point. The receiving carrier at such interchange point must move such cars within 24 hours of receipt into road service or to another carrier at the interchange point; provided, however, that not more than 48 hours shall be taken by all carriers at such interchange points from the time such cars arrive at the interchange point to subsequent movements in road service pursuant to the billed route.

(3) Where the billed route requires handling, of loaded freight cars at internal junction point(s) for transfer from one train to another of a carrier, such cars must be moved within 24 hours after arrival at such internal junction point into road service pursuant to the billed route.

(4) Inbound loaded freight cars must be moved from road service within 24 hours, exclusive of Sundays and holidays, in the destination terminal to the point of unloading or interchange tracks of the receiving industry or to a connecting line in the destination terminal. An additional 24 hours, exclusive of Sundays and holidays, shall be allowed to connecting line(s) to move such cars through the destination terminal for delivery to the receiving industry or for constructive placement. A total of not more than 48 hours, exclusive of Sundays and holidays, shall be allowed from arrival of such cars at a destination terminal to actual placement for unloading, or to constructive placement where two or more connecting carriers at such destination terminal are involved.

(5) The operating requirements contained in rule (1) through (4) above shall also apply to the handling and movement of empty freight cars of private ownership where such cars are tendered for movement in road service under bills of lading.

(6)(a) Loaded freight cars and empty freight cars of private ownership must not be moved contrary to billed instructions.

(b) Where loaded freight cars and empty freight cars of private ownership are moved via a route inconsistent with the billed instructions without justification as provided in rules 8(a), 8(b), and 8(c) hereof, the carrier(s) responsible for such routing error shall be subject to the claim provisions of rules 7(a), 7(b), 7(c), and 7(d) hereof for each 24-hour period or fraction thereof from the time such billed cars are moved inconsistently with the billed instructions until the time such billed cars are moved consistently with the billed route or until such billed cars arrive at the billed destination.

(7)(a) If a carrier fails to observe the operating rules contained herein, that carrier shall be conclusively deemed to have failed to provide service with reasonable dispatch; and a claim may be filed with such carrier by the shipper or receiver of the car(s) so delayed within 120 days of the occurrence of the delay. Claimant shall hold harmless the carrier(s) against which a claim is made hereunder as to any other claim for the same delay to the same car(s).

(b) The claimant shall be entitled to collect for each car delayed under the terms of these rules $10 for each of the first 24-hour periods or fraction thereof after expiration of the operating times permitted hereunder, $20 for each of the next two 24-hour periods or fraction thereof, and $30 for each subsequent 24-hour period or fraction thereof.

(c) The monetary bases provided in rule (7)(b) hereinabove shall be changed to reflect, and shall be equal to, any change in the demurrage charges generally applicable to domestic traffic as currently published in Section A of Item 930 series in Maurer's (Agent) Freight Tariff 4-I, I.C.C. H-36, and in supplements to or successive issues thereof.

(d) Within 15 days of written request by the shipper or receiver entitled thereto, a carrier subject hereto shall permit inspection of records disclosing specific dates, times and locations to substantiate the manner in which the car(s) specified in such written request were received, were held, and were forwarded at points on its line.

(8)(a) Delays beyond the time limits specified in these operating rules, if directly attributable to acts of God, civil commotion, riot, necessary repairs, car cleaning, wrecks, washouts, strikes, lockouts, or acts or instructions of shipper or receiver, shall be excluded in the calculation of any claim under the provisions of these rules.

(b) Billed car(s) requiring repairs or cleaning, whether loaded or empty, shall be placed on repair or cleaning tracks not later than the first 7 a.m., exclusive of Sundays and holidays, after the time such car(s) are carded for repair or cleaning or after arrival at the point where repair or cleaning is performed. Light repair or cleaning shall be completed on the same day, exclusive of Sundays and holidays, that such car(s) are placed on the repair or cleaning track; except that when necessary to order material from car owner to make repairs to foreign or private cars, repairs to foreign or private cars held awaiting such material shall be completed prior to 11:59 p.m. of the day which includes the first 7 a.m., exclusive of Sundays and holidays, after receipt of such material at the station at which the repair point is located. Light repair or cleaning is defined as repair or cleaning requiring less than 20 man-hours by repair track or cleaning track forces to complete.

(c) Where daily freight service has been discontinued by a carrier from any origin, terminal, interchange, or internal junction point, on the route pursuant to the billed instructions, the time limits specified in these operating rules shall begin to run as of 12:01 a.m. on the date of the next train operated by such carrier from such origin, terminal, interchange, or internal junction point.

(9) Any controversy or claim arising out of or relating to these operating rules shall be settled by arbitration in accordance with the rules of the American Arbitration Association, or its successor; and any judgment of such arbitration shall be final. Any judgment upon an award rendered pursuant to such arbitration may be entered in any court having jurisdiction thereof.

(10)(a) The provisions of these rules shall apply to intrastate, interstate and foreign commerce.

(b) Holidays shall be those listed in Item 25 Series of Agent Maurer's Tariff 4-I, I.C.C. H-36, and supplements thereto or successive issues thereof.

(11)(a) The provisions of any service order(s) issued by the Commission shall control and govern in the event of a conflict between the operating rules contained herein and the provisions of any such service order(s).

(b) The operation of all rules and regulations, except as provided in rule (11)(a) above, that conflict with the operating rules hereof is hereby suspended.

(12) Carriers subject hereto and claimants hereunder shall make quarterly reports to the Commission supplying such information respecting the administration hereof as may be required by the Commission.

NGFA believes that its proposal offers the dual utility of being self-policing and of being based on the long-accepted concept of demurrage to induce efficiency in car handling. The Association argues that German and French railroads operate under a plan that establishes schedules, service standards, and penalties; and that there is no valid reason why rail carriers in the United States should not be required to adhere to certain logistical standards—demurrage among them—or suffer the economic consequences. It estimates, based on the number of cars presently in service, that an increase of only 1 percent in operational efficiency should produce an increase in car resources of over 17,000 cars annually and assuming an average replacement cost of $10,000 for each car, over $17 million in added revenue. It also believes that setting its proposed standards and means of remedies would provide a real incentive for carriers to conform to certain standards of minimum efficiency on which the shipping public can realistically rely.

24. *New York State Department of Transportation* (Department) argues that in order better to understand the so-called "freight service problem," the following two questions should be asked: (1) Is there anything unique about rail transportation to cause service questions unique about rail transportation to cause service questions that require Government action? And (2) are present regulations hindering rail management in providing proper service? It questions the need for increased Government supervision in the area of rail freight service. It recommends, however, that rail carriers should be required to publish service schedules and reasonably adhere to them. The Department also calls for the promulgation of rules and standards to define the responsibilities of the users of rail freight service.

25. *Procter & Gamble Company* of Cincinnati, Ohio, is engaged in the manufacture and distribution of a wide range of food products, toilet preparations, and paper articles. It leases a fleet of about 2,000 private cars, the majority of which are tank cars. A rail performance record for the month of December 1971 was submitted by this shipper. According to this record, about 46 percent of a total of 2,733 carload shipments exceeded the "normal transit time" by 1 day or more, and about 10.6 percent arrived at destination 5 or more days over this standard. Shipper considers this transit standard very lenient since, for example, 22 days are allotted for a transcontinental movement from Sacramento, Calif., to Boonton, N.J. It argues that this can hardly be considered a standard for measuring "excellence" in performance.

26. *Quaker Oats Company* (Quaker Oats) of Chicago, Ill., is a grocery products manufacturer which principally relies on the railroads for the distribution of its food products throughout the United States. It is, therefore, vitally concerned with the quality of service it purchases. It measures and evaluates railroad service in terms of individual carload movements and is not concerned with switching or terminal delays, or road-haul time. As an indication of the current quality of railroad freight service, Quaker Oats states that of 24,091 carload shipments made to its customers during 1971, 17,620 or 73.1 percent arrived at destination on, or within 1 day (either more or less) of schedule. It recommends this 48-hour leeway as a standard of service, and further urges that any service meeting this standard less than 90 percent of the time be considered unacceptable. To demonstrate that this standard is capable of

achievement, it submits records of shipments on seven of its routes during the month of December 1971.

This shipper believes that the bill of lading should include a service element for a given move as well as contain evidence of the weight and the commodity description tendered by it. Quaker Oats suggests that appropriate penalties be imposed upon carriers for each succeeding day "off schedule." In this way the railroads would be given an economic incentive to render a reasonable quality of freight service commensurate with the freight charges shippers pay. As to Railroad Service Report Form BOp-105, Quaker Oats believes that it places too great a burden on the shipper to accomplish its intended purpose and is inordinately time consuming. Quaker Oats hence is skeptical that the Railroad Freight Service Report will accomplish its purpose.

27. *Reynolds Metals Company* (Reynolds) of Richmond, Va., is a manufacturer of aluminum and aluminum products. In the operation of its manufacturing facilities, it requires a continuous inbound supply of raw materials and outbound movement of furnished products. Thus, rail service with transit times both reasonable and predictable are vital to this shipper.

As a starting point for developing standards, Reynolds suggests that a basic table be compiled with mileage blocks listed in the first vertical column and the approximate transit time required for each block in the second vertical column, using the average freight train speed for the immediately preceding 12 months. Adjustments to the basic table can then be made to reflect additional time required by such traffic variations as interchanging at, or passing through, abnormal traffic areas such as Chicago and New York City. By using this schedule, appropriate charges can be imposed for the benefit of shippers in those cases where their goods have been held in transit for unreasonable periods of time. It believes that a proper remedy would be to allow shippers to recover their damages in an amount determined by multiplying the number of inexcusable days of delay by the value of the commodity times the going interest rate. Reynolds argues that this return to shipper should not be considered a claim, but instead should be treated as an offset to the transportation charges under the theory that the shipper had obtained less service than that for which he had originally bargained. In conclusion, it urges this Commission to take full advantage of the opportunity available in this proceeding by fixing definite standards of service required of rail carriers and specific penalties for failures to meet those standards.

28. *Southeastern Poultry & Egg Association* (Association) of Decatur, Ga., consists of individuals and corporations engaged in feed milling, shipping and receiving grains, and the production and processing of poultry and eggs in the Southeastern United States for distribution to points throughout the Nation. Specific examples of erratic transit times, the economic impact of irregular service, and the problems created particularly by the "bunching" of cars have been documented by the Association's feed mill members. In order to measure, and thereby encourage, reliability of rail freight service, the Association recommends that schedules be established that could be depended upon within a 48-hour range. Reliability is more important than speed in transit, according to the Association.

29. *South West Oregon Shippers' Traffic Association, Inc.* (Association), of Roseburg, Oreg., is a trade association composed of independent manufacturers of forest products located in southwest Oregon and served by the Southern Pacific Transportation Company, a rail common carrier. Its members depend upon rail transportation to move about 90 percent of their products to market.

Since the formation of the Association in 1959, it has compiled much evidence of car shortages and car substitutions against the size and type of cars actually ordered. It requests a clear definition of "reasonable service" and "proof of damages" so that a shipper can determine, without a court case, when he has not received just and fair service and car supply. It recommends a form of "reciprocal demurrage," by which the shipper could collect from the origin carrier "special monetary damages" when cars are not furnished in accordance with written car orders. In order better to plan production, a system providing for advance notice of prospective car shortages is advocated. Also, the Association believes that form BOp-105 is too complicated in that it requires detailed data and several man-hours to complete. Lastly, it urges this Commission to take the initiative in imposing constructive measures against the railroads in order to spur them to meet their legitimate obligations to the shipping public.

30. *The Toledo Edison Company* (Toledo Edison) of Toledo, Ohio, is a public utility furnishing electricity in a 2,500-square-mile area in northwestern Ohio having a population of about 705,000 people. Both of its major generating plants use coal as the principal source of energy, and, therefore, rail transportation is essential in its operations. Toledo Edison states that consistency of service is its most important guideline in determining the quality of railroad freight service it receives. Its major source of complaint stems from what is alleged to be the erratic switching services of the Penn Central Railroad.[1] According to shipper, loaded cars are brought in at irregular times, on some days no loaded cars are tendered, and on occasion empty cars are not removed and their accumulation hampers unloading operations. Such erratic practices also increase bookkeeping and the preparation of statistical records. Loss of cars from unit trains moved by the Norfolk & Western Railroad Company also creates operational and accounting problems for this shipper.

Toledo Edison urges Penn Central to establish a regular time, which could vary as much as 3 to 4 hours, for making deliveries and removing empties each working day. In the event that reasonable performance standards are established and the railroad's performance fails to meet those standards, shipper recommends that it be permitted to file a complaint with this Commission to obtain enforcement thereof. While Toledo Edison admittedly does not suggest how railroad management should solve its internal problems of car control or how this Commission should provide realistic remedies, it believes that it is entitled to receive improved rail service.

31. *U. S. Plywood-Champion Papers, Inc.* (U. S. Plywood), of Hamilton, Ohio, is a diversified, multimarket enterprise engaged in the manufacture and sale of paper products, building materials, and home furnishings throughout the United States and Canada. It ships over 125,000 carloads of the involved commodities a year. As a guideline relating to the quality of railroad freight service, U. S. Plywood recommends that carriers operate scheduled trains and that time in transit be a primary consideration in evaluating carrier service. With regard to schedules, shipper cautions us, however, to refrain from debasing good service by lowering standards to the level of the poorest carrier in a through route. It suggests that a penalty similar to the demurrage charge be assessed against the carrier, or if a joint route is involved, apprortioned among all carriers participating in the delay beyond an acceptable norm or "standard."

---

[1] By supplemental letter filed March 30, 1972, Toledo Edison states that since filing its initial statement there has been a marked improvement in switching service for the movment of coal by the Penn Central Railroad Company, for which Toledo Edison expresses its gratitude.

It warns that any attempt to fix service standards is likely to be a step backward in current efforts to simplify tariffs if quality guidelines have the force of tariff law. U. S. Plywood suggests that this Commission concentrate its efforts on a case-by-case interpretation of what carriers are obligated to offer the shipping public and how responsive that service is to the public's needs.

32. *Weyerhaeuser Company* (Weyerhaeuser) of Tacoma, Wash., is a forest products business engaged in growing, harvesting, manufacturing, and marketing a full line of wood and fiber-based products. Weyerhaeuser is a substantial user of railroad freight service, ships in excess of 80,000 carloads of finished products annually, and receives additional thousands of carloads of raw materials and purchased products for use in its manufacturing process.

Shipper's requirements for railroad freight service fall into two categories: (1) an adequate supply of railroad cars; and (2) predictable time-in-transit performance by rail carriers to assure uninterrupted production capability and satisfaction of its customers. Because the subject of car supply has been covered in detail in prior proceedings before this Commission, its statement emphasizes only the matter of railroad time-in-transit.

Weyerhaeuser has submitted summaries of a study it made of the movement of its wood products by rail from origins in Oregon, Washington, and Idaho, to Hartford, Conn., between June and September 1971, and to Portsmouth, R.I., between April and September 1971. Out of total of 195 shipments over 24 different transcontinental routes, 52.8 percent of these consignments arrived at destination after 11 to 15 days in transit. In contrast, 12.8 percent took as long as 21 to 25 days, and 6.1 percent arrived over 25 days after departure. Because of this variance in railroad transit time, Weyerhaeuser states that the effectiveness of its computerized car-reporting program has been minimized.

In an effort to aid this Commission in its investigation, Weyerhaeuser urges that a system of freight schedule performance reporting be developed similar to that used by airlines in their statistical reporting of on-time performance for passenger travel. Such a system it is alleged, should be based on published schedules for freight trains, with provisions for reasonable standards of plus or minus deviations and periodic reporting of performance against these measurable standards. It further recommends that this Commission sponsor shipper/carrier conferences to assure complete interchange and understanding of types of car information, tracing, scheduling, and reporting, all directed toward maximum compatibility and mutual benefit.

Weyerhaeuser believes that service guidelines should stress performance on individual cars; that standards should be based on published schedules; that a 24-hour maximum for loaded or empty cars remaining in terminal should be fixed and a percentage measure of consistency should be established; and that the possible assessment of penalties for nonperformance should be considered.

B. REPLY STATEMENTS

Respondent railroads filed a number of comprehensive representations in answer to those submitted by shippers and receivers of freight who utilize rail service. Their pleadings contain arguments in behalf of all railroads which may be affected by the outcome of this investigatory proceeding, and include arguments as to the impracticability of railroads being required to publish dock-to-dock schedules. Detailed descriptions are also given of (a) various innovations designed to control rail operations and improve communications, and (b) expenditures made by railroads to improve their facilities, equipment, and the quality of their service.

In addition, a statement by an official of the Operations and Maintenance Department of the Association of American Railroads summarizes respondents' individual pleadings, offers evidence to rebut specific criticisms and proposals of the nonrailroad interests, and rejects the notion that the primary problem in rail service today may be a lack of motivation on the part of railroad management to improve service. The main thrust of these statements is that railroads are always aware of the importance of good service and continuously have been doing all they possibly can to improve such service. It is contended, however, that railroads are severely handicapped in their efforts because of their inability to attract capital or increase their operating revenues. Although indicating a willingness to accept the basic reporting procedures of form BOp-105, respondent railroads oppose the prescription of any corrective rules with respect to service deficiencies. The basis for their opposition is the argument that they are entitled, under the Administrative Procedure Act, to prior notice of the terms or substance of proposed rules. Respondents aver that a procedure which allows for underscribed Commission sanctions would serve no purpose if there were only a few situations in which corrective action had not been taken to satisfy a particular complainant.

The railroads contend that this Commission not only lacks the authority to prescribe rules concerning their actual operations, but also has specifically disclaimed jurisdiction over disputes founded upon delay in the delivery of shipments, citing *United States* v. *Pennsylvania R. R. Co.*, 242 U.S. 208 (1916), and *Badger Lumber & Coal Co.* v. *Atchison, T. & S. F. Ry. Co.*, 156 I.C.C. 427 (1929). They believe that proposals such as reverse demurrage, two-level rates, and rate reductions —which were suggested in many of the shipper statements filed in this proceeding—are essentially awards of damages for loss of profits resulting from delays in transit; and that this Commission lacks the statutory power to prescribe rules and regulations having such effect. Moreover, respondents argue that the Interstate Commerce Act does not confer upon this Commission jurisdiction to regulate, as a "practice," the operations of a rail carrier. *United States* v. *Pennsylvania R. R. Co., supra.* The railroads go on to argue that only the courts may enforce a railroad's duty to receive and trânsport a shipper's goods by means of an injunction, and that in all probability the Congress concluded not to confer such power on this agency because the courts had been given that power, citing *Peoria & P. V. Ry.* v. *United States*, 263 U.S. 528 (1924). They concluded that, with the sole exception of Ex Parte No. 241, *Investigation of Adequacy of Freight Car Ownership*, 335 I.C.C. 264 and 874 (as modified in 341 I.C.C. 64, affirmed in *United States* v. *Allegheny-Ludlum Steel*, 406 U.S. 742 (1972)), this Commission has not exercised jurisdiction over the operations of the railroads; and that where injury has occurred because of improper operation, the appropriate remedy has been left to the courts.

Respondents believe that, while this Commission has the expertise to regulate the railroads from an economic standpoint, and entirely new level of data and personnel would be required to evaluate rail management's operational decisions. Without being closely associated with the carriers' day-to-day operations, arbitrary judgments would assertedly be made by us.

A requirement that the carriers publish dock-to-dock schedules or even city-to-city schedules could not possibly be accomplished, according to respondents, because of the astronomical number of routes and route combinations involved in such a project. They assert that the expense of developing such schedules would be beyond the resources of the rail industry and, in the event that this Commission should require the publication of schedules, low performance stands would have to be established in order to guard against all possible operational contingencies. The publication of valid schedules is thus impossible in their judgement; and, accordingly, reverse demurrage, two-level rates, and rate reduction systems would have no useful purpose or practical application.

The railroads submit that their progress in the development and use of informational and control systems attest to the existence and adequacy of their motivation to improve service; that a "shipper be damned" attitude is inconsistent with good business judgment since carriers have only their services to sell; and that some carriers' lack of resources, and not motivation, is the essential reason that all do not have the same capability to provide service of a higher quality.

While expressing full realization of their duty to provide reasonably satisfactory service, respondents aver that, without doubt, acts of God and the shippers and consignees themselves contribute to at least some of the erratic service which may occur from time to time; and that they are powerless to do anything about those causal circumstances. To support this position respondents submitted a summary of asserted facts with respect to 41 complaints filed on form BOp-105 involving the service of the C&NW.

Respondents are convinced that if pending legislative proposals which would allocate substantial monies to the railroads are enacted by the Congress, further implementation of the systems developed by the leading rail carriers will occur and real-time information necessary to solve operating problems will then become available. They are also encouraged by a recent grant of $3 million by the Department of Transportation to assist in the purchase of information and control system equipment for expediting rail traffic through Chicago. They contend that any penalty system would (a) divert, rather than foster, the funds needed by the railroads; (b) require the publication of a plethora of schedules based on low operating standards; and (c) stand as a severe obstacle in the way of progress toward better service. Respondents, therefore, urge this Commission to authorize them, in appropriate proceedings, to publish rates and charges that will produce revenues sufficient to enable the railroads to acquire the systems that are so vital to the improvement of service. Penalty systems, it is argued, will be counterproductive.

1. *Association of American Railroads* (AAR) of Washington, D.C., states that one of the essentials for the improvements of railroad service is a basic rail plant in such condition as to permit the carrier to offer reliable service. It contends that the quality of rail service is directly dependent upon sufficient and modern railcars and locomotive power as well as an adequately maintained yard and track structure.

A second essential for the provision of regular and dependable rail service, according to AAR, is an extensive information and control system capable of focusing on the total service given individual freight cars and accumulating such information for monitoring and analysis by carrier management. Regularity of service assertedly would follow as a matter of course by improvements in such a system. It points out that a national car information system study by over 50 railroad officers was submitted during the spring of 1972 to its board of directors. This study concluded that such a system embracing all of the Nation's railroads was technically feasible and economically justifiable. In the proposed system, a large central computer linked to railroads through a communications network would accept data as to origin, destination, commodity description, interchange of cars between railroads, crossing of regional boundaries, and changes of car status as from loaded to empty and from in-service to bad order. These data would then be processed and made available to management and the so-called Car Service Division for their use in the more effective distribution and utilization of freight cars. It is contended that the communications network would permit the exchange of data among railroads and the transmission of administrative messages throughout the system; enable customers to obtain daily information from central source on the last reported location of prespecified cars; and made possible, for the first time, national studies of interline freight service. The proposed system would not contain information on the exact location of all cars at all times, calculate actual miles traveled, or schedule the movement of cars; but it would be capable of being expanded at a later date to incorporate such additional capabilities. AAR states that, at this time, a major effort is underway to study the design of the proposed system.

According to the AAR, proposals such as combining stricter regulations with penalties would only thwart the progress which is being made in service, for the reasons that such measures are based on the erroneous assumption that there is a lack of motivation on the part of railroad officials and a lack of service orientation in the industry. It argues that an essential factor for the improvement of service regularity is an adequate level of financial resources, rather than more restrictions. According to AAR records, the industry has experienced a deficit in earnings[2] each year for 1963 to 1971 with the result that during that period a total deficit of $4,844 million has been sustained. AAR asserts that this trend with regard to income and capital expenditures discredits the charge of an industrywide lack of motivation.

Data submitted by AAR show that during 20-week period beginning January 19, 1972, 331 form BOp-105 complaints have been forwarded to this Commission relative to the service of 15 railroads, and that during the comparable freight service period these 15 carriers handled approximately 11.4 million carloads of freight. It is contended that even if actual deficiencies were 100 times the number of complaints filed, the result would be that only about 0.25 percent of the freight traffic moving has resulted in deficient service, and that under these circumstances present railroad freight service is satisfactorily meeting the needs of a large number of shippers and consignees.

In its argument with regard to the limited utility of published line-haul schedules, AAR points out that the implementation of such schedules could not be used as a tool by the shipping public to evaluate the more relevant overall or dock-to-dock performance of the railroads. It asserts that the railroads continually respond to requests by the shipping public for schedule data on applicable services, but that any requirement that schedules be published in tariff form with the added burden of 30 days' published notice—or, for that matter, any notice—before changes could be effected would seriously impair the railroads' ability to respond to rapidly changing situations. The anticipated result of such a requirement would be that efforts by the railroads to provide the most efficient and economical transportation to customers would be frustrated. Moreover, AAR believes that it would be impractical to publish schedules in the Official Guide or elsewhere because of the almost 3 billion schedules involved in the Nation's single-line railway operations and the even greater complexity of joint-line rail operations. It contends that because all commodities do not require expedited transportation and because most of those commodities which do require such service (such as perishable products) have applicable schedules which are published in the Official Guide, any implementation of other schedules should be voluntarily assumed by the railroads.

---

[2] Includes ordinary net income, depreciation, and retirement charges, less cash dividends and capital expenditures.

The Association objects to proposals calling for the publication of in-terminal standards for the placement or pulling of cars for the reasons that (a) the myriad of alternative combinations that pertain to car and route classification within any reasonably large terminal would present immense problems in the organization and maintainence of up-to-date schedules; (b) the daily fluctuations in volume and types of freight would work against any attempt at the precise scheduling of traffic moving through terminals; (c) there are a number of outside factors, such as weather, interconnections with other railroads, and shippers' special demands, which increase the unpredicatability of terminal switching operations; (d) in-terminal standards do not ensure the precise determination of overall time from the shipper's standpoint; (e) certain moves out of a terminal require more time to organize than others; (f) rigid adherence to the placement or pulling of cars within the time limits of schedules would contitute a wasteful and costly utilization of yard crews and equipment; and (g) in order to defend against claims that standards had not been met, a new and elaborate level of recordkeeping would be required.

Reverse demurrage penalities or dual-rate systems keyed to varying levels of performance are opposed by AAR on the grounds that (a) given the existing state of the basic rail plant and the current applications of information and control systems, the carriers are providing the best service that operating economics will support, and penalities would only divert the funds needed to improve service; (b) such measures create an opportunity for seeking and obtaining favored treatment of one shipper over another; (c) the side-by-side existence of basic and preminum service would force increased expenditures for switching facilities, computer control systems, ratemaking procedures, and management in general; (d) existing schedules of time-sensitive trains are set as tight as possible, in part to achieve a minimum running time between origin and destination terminals, and any penalties assessed for failure to make such schedules would be an obvious inducement generally to lengthen the schedules as a defensive measure to minimize penalties; (e) the possibility of a penalty levy would tend to cause connecting-line carriers to "run away" from late deliveries by others; (f) guaranteed deliveries on the general run of traffic has never been a part of the offering of the railroads, and to impose such standards would end the railroads' ability to offer uniformly lower rates by distributing the common and joint costs of operation over all users; (g) no proposals, affecting revenue should be adopted before their financial impact on the railroad industry has been determined; and (h) the carriers already sustain heavy burdens for poor service as delays in car movement result in expenses associated with added line and yard congestion and in the likely diversion of traffic to another mode of transportation.

In its argument against the proposal that carriers be required to report on their performance as measured against established schedules, AAR asserts that such a requirement would be impractical on a national scale because interline performance data are not presently available. As to the proposal calling for a substantive definition of "reasonable car supply" it states that the railroads and this Commission has undertaken this task in Ex Parte 241, *Investigation of Adequacy of Freight Car Ownership*, 335 I.C.C. 264, and 874, and that, therefore, it should not be retried in this proceeding.

In response to the proposal embraced in some of the initial statements that railroads be required to notify shippers when ordered cars will be placed, AAR states that (a) since there are many shippers which do not require such notice, a blanket requirement applicable to all cars would create a substantial and unnecessary burden, and the matter is best left to communication between the shipper and local carrier representatives; (b) notification based on prior advice from the consignee unloading the ordered cars is unreliable since delays in releasing cars are beyond the carriers' control; (c) actual or constructive placement of cars could be avoided by shippers where spotting occurs at times other than customary working hours; and (d) any advance notice by carriers should necessarily be coupled with more responsibility on the part of shippers which oftentimes provide neither written orders nor forecasts of need.

In conclusion, AAR maintains that before service standards may be found warranted—which, of necessity, depend upon the existence of a basic rail plant in first class condition and the use of modern information and control systems industrywide—the railroads must first be given a chance to obtain the financial resources needed to put these measures into effect.

2. *The Atchison, Topeka and Santa Fe Railway Company* (Santa Fe) operates principally in the geographic region bounded by Chicago, Ill., California, and the Texas Gulf Coast. This carrier states that during the past year it has revised its freight schedules to a degree greater than any prior annual period with the aim of improving both direct-line and interline services. Thus, according to Santa Fe, delays in on-time performance, upon which its schedules are based, and complaints from shippers using its services, are currently at minimum levels.

Santa Fe has recently established a quality control department charged with the responsibilities of measuring dock-to-dock carload service and the prevention of freight loss and damage. The railway acquired over 8,000 new or rebuilt cars during the period from 1968 through 1971 and now, rather than experiencing an equipment shortage, it states that it has a surplus of virtually every variety of freight car. Additionally, the car location data available from its computers have significantly expedited car tracing and aided in meeting the increased loading requirements of its shippers. It is unable to predict if it will be able to guarantee schedules for all carload shipments, and it believes the publication of schedules between all points to be impossible.

3. *Burlington Northern, Inc.* (BN), maintains a vast rail network which links several Midwestern States with the Pacific Northwest via Montana and Wyoming. It daily operates over 120 scheduled through-freight trains and about 450 scheduled local trains. BN expresses strong opposition to the prescription of mandatory service standards and accompanying sanctions on the ground that the burden of such controls would increase costs and ultimately force freight rates to rise.

BN outlines its recent pattern of capital expenditures and details improvements in its system of car monitoring and classification. The time savings which result from its 6 automated yards and 25 "runthrough" operations with connecting railroads are characterized as both substantial and consistent. According to BN, yard operations at each of its 46 terminals have steadily improved by application and refinement of its terminal performance controls which are based on exception analysis of car movement against an appropriate schedule. Such schedules reflect standard times required for switching cars in each kind of movement within the terminal and are intended to be incentive standards. Should this Commission impose mandatory standards and penalties, BN argues that rail service would deteriorate because schedules would have to be less rigid in order to avoid monetary burdens.

Based upon the past 3 years, data submitted by BN show a marked improvement in line-haul train performance, with about 65 percent of its prime scheduled trains arriving at destination terminals on time or less than 2 hours late during the first 5 months of 1972. Train performance is compared to incentive schedules which reflect management's judgment as to achievable standards of performance and is published in the form of a train brief.

BN performs scheduled movements of empty cars to expedite distribution to origin loading points, and it points out that empty cars would be traditionally moved at random as fill for scheduled trains or in extra trains when demand required such service. In addition, selected data submitted by BN demonstrated its capacity to meet sporadic increases in shippers' demand for cars. It attributes this ability to meet demand to a generally adequate car supply as reflected in the 80 percent on-line ratio of company-owned cars to foreign-line cars.

BN's bad-order car ratio has declined from 6.9 percent in April 1970 to 4.3 percent in April 1972. A capital investment of $1.64 million in car maintenance and repair facilities during 1970 and 1971 is given as the reason for this reduction. An even greater decline in bad-order locomotives occurred during this same period.

In order to provide rapid, accurate information to the shipping public, BN maintains an around-the-clock information service department where immediate reports of waybill information, car location, and other data are obtainable within the limits of existing computer capabilities. This information service is operational in three of BN's six operating regions and was projected for systemwide use by October 1, 1973.

The measures which BN has taken toward improving service assertedly demonstrate management's motivation in that area. BN argues that, given the record of the railroads in applying much of the funds derived from past rate increases to capital improvements, there is no merit in the proposal that future rate increases should be conditioned upon some service record. It concludes that its management should not be subjected to the distraction of monetary penalties in making operating decision, nor be expected to improve service in view of the effect such penalties would have on its working capital. It believes that penalties will only reduce the availability of funds for the continuation of its service-oriented programs of improved car distribution, movement, and communications.

4. *Chesapeake and Ohio/Baltimore and Ohio Railroads* (Chessie System) operate about 200 scheduled manifest trains each day over a rail network comprised of a theoretical maximum of more than 4,500 routes. Performance is monitored over a few hundred of its heavily travelled service routes by a computerized information system. Only terminal-to-terminal or interchange-to-interchange data are presently available, but eventually the Chessie System will produce dock-to-dock information and will cover through movements with other railroads. As illustrated by various exhibits displaying traffic data, its information system allows for the comparison of actual movement times with those of the standard, the identification of repetitive failures, and the determination of appropriate corrective action.

The Chessie System cautions that there are severe technical and practical limitations to what is possible in the area of service performance measurement. It maintains that, in the first place, adherence to schedules can be improved only on the basis of history, and once a specific car has been delayed, very little can be done to get it back on schedule. It points out, however, that a service control system based on predictions of real time is not being developed which would improve the chances of immediate correction of deficiencies. Ascertainment of the number of cars above a train's capacity and the calculation of the optimum time needed to meet the original schedule by running an extra train will be additional benefits of this development.

Secondly, it asserted that because of the diversity of traffic on any railroad, the capability and technique are not now available to measure and control traffic which moves by unusual routes or without patterns. Improvements in present service must, it is argued, be based on recurring patterns of deficiencies. It is mainly for this reason that the Chessie System cannot foresee a practical way to provide dock-to-dock schedules for the approximately 20 percent of its present traffic which is nonrepetitive. After a pattern develops, ,however, information can be accumulated that will reveal operational flaws and allow for the adjustment of switching, local freight, and related activities to provide the most efficient service.

The Chessie System is currently sharing data with two connecting lines for the purpose of measuring interline service, but to date has been unable to establish interroad service standards. Because the number of point-to-point combinations increases geometrically as more railroads are added to the service network, interline traffic assertedly assumes many of the same characteristics as nonrepetitive on-line traffic.

The railroad does not foresee how it can ever be practical to schedule and control all individual cars, particularly where nonrecurring movements are involved. Thus, because delays in the totality of its traffic cannot be measured or controlled even by flawless management, the Chessie System asserts that the imposition of fines, rate penalties, or more regulations will not improve service. It concludes that there is a great incentive to improve service; that sanctions will not increase that incentive; and that the near future holds the promise of dramatic improvements in rail service quality.

5. *Penn Central Transportation* (Penn Central) states that implementation of various proposals advanced by the rail shippers would constitute an impractical and undesirable "legislation" of railroad performance. It asserts that artifical stimuli in the form of additional rules, regulations, and penalties are not needed as an incentive to improve service. Rather, it represents that only through improvements in service can it be guaranteed its share of available traffic volume. Since it has entered reorganization, it maintains that major strides have been made in improving its service, and that opportunities are constantly being sought to enhance service within its financial limitations.

In controlling the movement of freight, Penn Central focuses on the performance of both key trains and major terminals in making scheduled connections between key trains, interchanges, and industrial transfers. Its central control center in Philadelphia ensures that these functions are performed according to program and provides for adjustments to accommodate fluctuating traffic levels, derailments, equipment failures, or other conditions which might impede service. Penn Central polices interterminal and individual train performances to improve dependability which is most important to customers. Service is also monitored by its marketing department's computerized Quality Control Program which measures dock-to-dock performance between some 2,700 key points. The railroad is working to expand this program to measure interline service on the same basis.

"Actual" transit times are compared against standards based upon established freight schedules, service improvements are proven by increases in average car-miles per day, and management meets weekly to review the results of these measurements and arrange for any service adjustments necessary to maintain satisfactory performance. In this regard, Penn Central makes every possible attempt to bypass rail yards—and thereby minimize handling at intermediate yard—by preblocking whenever there is sufficient traffic volume. It operates 47 daily runthrough trains in cooperation with other railroads. Penn Central's published freight service schedules are updated at least once a month, and are distributed to about 2,200 places, including sales offices, foreign lines, and shippers. Its automated car location system provides customers, upon request, with daily status reports for their line shipments.

In its 1972 improvement program Penn Central foresees a considerable expenditure for the purpose of providing one efficient "north-south" route, taking the place of the three existing branch lines now used for this traffic. When completed, this route assertedly will afford better service between major points in western Ohio, Indiana, and Michigan, as well as St. Louis, Mo., and Chicago, Ill. Also, major improvements in key classification yards recently have been made at five specified locations.

A new intermodal department coordinates Penn Central's TOFC service, which offers 46 trailvan trains daily and constitutes the Nation's largest operation of this type—handling 20.7 percent of all TOFC traffic. In addition, it states that its unit coal trains can make as many as 150 round trips a year, compared to 18 such trips by cars operated in conventional coal service. It operates about 650 unit coal trains per month, and Penn Central's coal operation accounts for 34 percent of its freight tonnage and over 15 percent of its total freight revenue.

In 1971, Penn Central acquired about 7,500 new freight cars and 187 locomotives through long-term lease arrangements. As indicated by submitted data, this program of equipment acquisition and improvement was continuing in 1972. Evidence of advances in track and equipment maintenance, radio communication, and average car-miles traveled a day was also introduced. In order to improve its service on articles of excessive size or weight, the railroad has established at Philadelphia a Bureau of Exceptional Shipments. That Bureau maintains surveillance over the progress of excess dimension loads and arranges for any special handling which might be required.

In an effort to cure deficient service, Penn Central has reviewed most of the initial statements filed in this proceeding and has contacted the complaining party where its participation in the deficiency could be identified. In specific reference to the comments of General Foods and Toledo Edison, the railroad points out that these shippers have communicated that recently there had been a marked improvement in the line's service for which the shippers were grateful. Considering the number of complaints filed in the light of the volume of traffic handled by the industry, it concludes that there is only a very small amount of traffic in which any significant deficiency is involved. Penn Central asserts that this position is strengthened by the fact that during the first 6 months of 1972, it received only eight form BOp-105 service complaints. Moreover, it contends that the reported deficiencies were the result of mere inadvertence or "human error" and not the product of any willful or conscious indifference to the shipper's requests or needs. Penn Central disagrees with the parallel drawn by certain parties to the proceeding concerning standards of service in the railroad and telephone industries. It asserts that the business of railroading is no longer a monopoly, that prices are primarily governed by competition and whatever rate of return this Commission will allow, and that large segments of the industry are laboring without adequate revenues.

Although Penn Central acknowledges the novelty and possible merit of some aspects of a two-tiered system of rates based on the quality of service, it represents that any trial of such a plan should be limited to individual circumstances and be on a voluntary basis. It perceives some difficulties with this proposal because (1) unless there were a guaranteed minimum volume in scheduled operations, carriers would run the risk of performing the "superior service" at a loss; (2) the "superior service" rate has its limits in that it would have to be competitive with existing rates for highway service; and (3) the task of determining in each instance whether the performance of a railroad called for penalties or reductions in the charges would require another layer of expensive clerical services.

Penn Central would reject altogether the suggestion that future rate increases be conditioned upon railroad performance geared to certain standards. It argues that, as between parallel lines, the energetic carrier which meets a given standard could not take an increase and remain competitive if the increment were not likewise authorized for the less progressive line. Moreover, it points out that the latter may not be progressing simply because of its present financial condition.

The publication of performance standards in tariff form would likewise be objectionable to Penn Central. It states that it has already developed standards in numerous areas, but that these are constantly reassessed and the approach must be flexible. Also, rather than reporting in-terminal performance on a detailed car-by-car basis, it suggests its own approach which is to assess the quality of service on a cumulative, recurring basis. In the case of road trains, Penn Central measures performance on at least 135 of its scheduled daily trains and indicates a willingness to expand this coverage.

In conclusion, Penn Central believes that some of the proposals advanced by the shippers might have merit if the railroads were financially fit and extensively automated. Consideration of the present limitations in the industry, however, brings this railroad to the conclusion that the suggested remedies are overly simplistic and fundamentally unworkable.

6. *Seaboard Coast Line Railroad Company* (Seaboard) contends that the shippers in this proceeding would have this Commission impose impractical and costly operating requirements, thereby necessitating further rate increases, or, in the alternative, deprive the railroads of rate increases which are the only means by which service improvement programs can continue. Neither measure, according to Seaboard, could possibly improve the quality of freight service.

Seaboard operates in six Southeastern States and maintains multiple daily freight schedules over its principal routes. While noting that requiring railroads to publish schedules may be superficially attractive, it cautions that in reality the rigid application of fixed schedules would create more problems than it could ever cure. Seaboard states that schedule changes are made necessary by changes in shippers' needs, improvements in connecting service, the ebb and flow in the level of business, and other matters over which rail carriers have no control. Thus, according to Seaboard, fixed schedules and penalties for failure to meet standards would necessitate numerous exceptions and divert funds desperately needed to improve rail service.

Seaboard argues that railroads have the forceful incentive to move traffic as expeditiously as possible since the failure to do so results in customer dissatisfaction, a substantial increase in equipment costs, and additional track storage space to hold cars awaiting movement.

Since July 1970, capital expenditures totalling $7.8 million have been made by Seaboard for new construction and improvements in terminals, interchange facilities, and repair shops. Also during that period, Seaboard's expenditures for 123 line-haul locomotives and 5,657 cars totalled $120.7 million. It states that these improvements have a direct effect on customer service because they involve facilities and equipment that are essential to reliable operations.

Seaboard has recently inauguarated service on five runthrough trains which bypass intermediate terminals. As connections at interchange points are assured, a substantially expedited service is provided. It is argued that other improvements in service, as well as increased attention to daily supervision and planning have resulted from today's competitive situation and the necessity for railroads to control expenses, and not from the threat of punitive action by regulatory agencies.

7. *Southern Pacific Transportation Company* (Southern Pacific) submitted three comprehensive statements describing in detail its industry goals, physical plant, and operating procedures. According to Southern Pacific, faster and more consistent line-haul service is achieved by switching a given car the least number of times so that as much traffic as possible is moved in destination-oriented trains. To implement its plan, the appropriate car-blocking strategy is programmed into a computer. The computer, which has cost the railroad over $22 million over 10 years, evaluates on-line or real-time operating information. Train content also is monitored to ensure that the blocking strategy is followed. When a car is detected in a block in which it does not belong, the terminal is notified so that the misplaced car may be switched out for correct movement. The railroad's computers also calculate the horsepower per ton required to achieve over-the-road standards.

According to Southern Pacific, it pioneered in the runthrough block train concept. Solid trains are made up at origin and are "run through" intercarrier, interchange points with only a change in crew. No switching is performed, and in most cases its own engines and cabooses remain on the train. Southern Pacific currently participates in runthrough operations with the Cotton Belt, Rio Grande, L & N, Southern Railway, Penn Central, Norfolk & Western, the Chessie System, Illinois Central, and Rock Island; and these railroads reciprocate with return trains. The content and frequency of the blocks may change from time to time depending mainly on fluctuating traffic volumes for specific destinations.

In order to upgrade motive power and to improve equipment utilization and service, Southern Pacific has established a 24-hour centralized power bureau which distributes power and schedules locomotive maintenance on a systemwide scale. As a result of this bureau, utilization of motive power measured in miles per unit has been improved by 15 to 20 percent. From 1964 to 1969 the railroad added 1.05 million horsepower to its fleet, an increase of 32 percent. As the gross ton-miles operated during this period increased by 14 percent, most of the added power assertedly contributed to improved service and more reliable scheduling.

Southern Pacific pursues a continuing program of modernizing its fixed plant because of the increasingly heavier loads and higher speeds required by its shippers. Details of its track and structure improvement programs, and improved methods for handling TOFC traffic and car location, are set forth in its verified statements.

Terminal operations are coordinated primarily at its computerized hump installations at Eugene, Oreg., Houston, Tex., and Colton, Calif. As a train arrives in the receiving yard, decks of computer cards representing individual trains or cuts of cars are placed into a computer which automatically controls yard retarders and switches. All cars are then logged onto the individual classification tracks in proper sequence. Southern Pacific's new West Colton yard is designed to classify cars at a rate of six to eight a minute and has the capacity to handle 100 percent of its west coast traffic destined to eastern points.

The railroad considers communications an important factor in the efficiency of its operation and has, therefore, installed a microwave radio network systemwide, covering approximately 6,300 miles of railroad. In the event of a commercial power failure, operation is handled by emergency battery power at each station. Its microwave system provides a substantial medium for intercity communications and promotes efficient train operation by eliminating delays in transmitting orders to wayside operators or train crews.

Scanners, magnetic sensors, and other sophisticated electronic equipment which it identifies by various acronyms are used by Southern Pacific to monitor car and engine movements in terminals and to feed data to its computers and thereby provide management and shippers with accurate, current car information. According to the railroad, the timely identification of delays in the movements of cars, which this reporting system affords, when coupled with immediate followup by the relevant carrier, results in the increased utilization of equipment.

Southern Pacific's freight car fleet, which it characterizes as the most modern in the industry, totals about 84,000 cars. An additional 4,289 cars were expected to be acquired in 1972. The railroad has undertaken a number of boxcar rehabilitation programs at its shop facilities to widen doors and install new floors and interior sidings and roofs. A mechanically refrigerated car fleet designed for the transportation of perishable commodities is controlled by Pacific Fruit Express Company which is owned jointly by Southern Pacific and Union Pacific. When fully fueled and released to the railroad for blocking, these cars are capable of providing full refrigeration service for transcontinental consignments.

The railroad continues to establish incentive freight rates wherever practicable. These lower rates encourage heavier loading and are mutually beneficial to shippers and carriers since they reduce unit transportation cost, increase revenue per car, and result in more efficient utilization of equipment.

A special staff, the Freight Car Planning and Research Group, has been established to assist shippers in the handling and transportation of their freight. This group is representative of a variety of interests, including engineering design, terminal operations, loading, packaging, and related economic analysis. In principle, the overall movement of goods is viewed by the railroad as a continuous process, from production line to final consumer, with the line functioning as a vital segment of the "transmission belt." The long-range objective of the special staff is to determine changes in traffic and car supply patterns and thus aid in the forecast of new car acquisitions and modification or retirement of existing equipment.

According to Southern Pacific, one indicator of the effectiveness of a line's car maintenance program is its bad-order ratio. As of May 1, 1972, Southern Pacific's ratio stood at 2.6 percent compared to a national average of 5.8 percent, and this record assertedly reflects a continuing injection of new equipment into service, along with effective maintenance policies for existing cars. Its equipment maintenance program includes such facilities as ultrasonic inspection of locomotive and car axles, wheels, and bearings; automatic hot box detectors installed at yard entrances and designed to measure bearing temperatures; dragging equipment and loose-wheel detectors; wet magnetic particle inspection of wheels; composition brake shoe research; and testing of lubricating oil by means of radioactive isotopes to determine piston wear.

Southern Pacific intends to press forward on many fronts in its efforts to provide faster, more economical, and efficient, service to its shippers. To that end, research and development work has already been undertaken in many technical, operational, and economic aspects of railroading.

8. *Southern Railway System* (Southern) states that although it presently has the computer capability to measure service on selected traffic, a system capable of analyzing dock-to-dock performance on a real-time basis is some years away. According to Southern, there will have to be a substantial increase in communications capability and computer design before standards for overall service can be developed. It expects within 2 or 3 years to be able to monitor an individual car moving between major points on its system and to determine the extent, if any, it has moved off schedule.

Southern contends that standards relating to joint-line traffic must be formulated on a national basis and that each railroad would have to develop compatible data-reporting facilities. Thus, given the quantity of possible combinations involved in such traffic and the cost of development, it cannot state at the present time that the industry would never find this undertaking feasible. It believes that the shipper's ability to measure performance is greater than that of the railroad industry, as the shipper is generally concerned with a smaller fleet of cars from and to a limited number of origins and destinations.

Southern asserts that the search for more reliable transit time is complicated by factors over which the railroads have virtually no control. These conditions, according to the railroad, can be traced to such variables as differing workweeks, market fluctuations, labor problems, seasonal shipments, and planned shutdowns by specific industries. It contends that if schedules were required to be followed without consideration of these variables, the railroads could no longer use their 7-day workweek to smooth out the peaks of traffic flow. It is also argued that if peak operating requirements were set, increased costs would cause rates to be much higher than they are at present. Lastly, in response to the proposition that railroads should be penalized for delays, Southern believes that in those instances where the delay is clearly the carrier's fault, a built-in penalty exists in the form of the additional car and handling costs that directly results from the delay. According to Southern, this intrinsic expense represents a sufficient inducement for railroad management to do everything possible to avoid delays.

9. *St. Louis-San Francisco Railway Company* (Frisco) submitted numerous computer-produced control reports and periodic statistical summaries which are the basis of its service information system. According to Frisco, its control system establishes a central data base covering each status change for each car, trailer, container, engine, caboose, waybill, and train on its tracks. It states that each change of status is required to be reported in the same sequence as it occurs and all activity reportings are subjected to a very rigid-on-line edit before being permitted to enter the control system.

Frisco's statement also contains a full discussion of its equipment data bank which, for inquiry purposes, is contained in three primary files—equipment tracing, terminal, and home route. Data are continuously extracted from these files for the preparation of periodic reports which are necessary for internal distribution of equipment, measurement of the quality of overall transportation service, and compliance with the mandates of the various regulatory bodies. Car distribution is monitored by a series of periodic reports designed to reveal deficiencies in utilization.

The railroad's ability to decrease detention time at terminals has assertedly been improved by the analysis of daily computer reports covering the condition of its major and secondary terminals. Graphs based on the average elapsed time of cars at each terminal are produced each week and distributed to the line's management. Its basic terminal report matches originating moves with terminating moves at terminals, giving up to 17 possible terminal activities. Frisco states that its data pertaining to terminal operations allow almost immediate action required to correct a deficiency or improve performance. Serious delays are handled with appropriate superintendents by telephone and by written correspondence; they require explanation and correction of causal situations which vary from the norm to any appreciable extent.

Overall service given to cars moving between selected junctions is also monitored since, according to Frisco, small delays occurring at each of several terminals could accumulate into a substantial overall delay. Total transit time is calculated for interchange receipt at the oncoming junction to interchange delivery at the offgoing junction. The standard or maximum allowable time is the longest aggregate acceptable transit time from receipt to delivery which includes time at oncoming and offgoing junctions, as well as schedule time. Weekly statistics of overall transit time are then charted and distributed to management for review and detection of deficiencies. Summaries are also prepared every four weeks and these are helpful in evaluating the activities of junctions which handle smaller volumes of traffic.

Review of graphs reflecting the railroad's operations over an entire year reveals that in 1971 operations were better than those in 1970 and that its 1972 operations were better than those in 1971. Based on this record, Frisco asserts that its performance is improving year by year toward the goal of errorless service, and that substantially poor operations occurred only during periods of railroad strikes.

Recently, new information was made available to Frisco's management which, for the first time, analyzes performance as a series of schedule segments. Thus, each segment such as departure time at origin, time between stations, dead time at yard or station, or arrival at destination, can be given separate analysis. It is stated that this approach permits (a) the detection and isolation of repetitive situations where a particular segment performance varies in any significant degree from schedule, and (b) the contrast of segment operations to the overall train performance. The relevant data are displayed in the form of three different reports: compendium of train operations, train performance report graphics, and evaluation of location.

In order to guarantee a high quality of data input to its computer, Frisco administers a clerk-telegrapher training school with corporate personnel serving as instructors. In addition to teaching students what to do, the reasons for the procedures are also explained. Training includes keypunch, teletype, train order, operating rules, and accounting procedures. Competition is keen between terminals, divisions, and individuals for the goal of the lowest error ratio for input data.

The performance standards which Frisco has established are asserted to be based upon virtually perfect operation. In this regard, application of these standards assumes that the trains move in accordance with expected time, that there is sufficient power to pull all of the cars tendered for transportation, that all of the cars are released to the carrier in time to reach the outbound train scheduled to run on that particular day, and that there are no hot boxes, derailments, engine failures, or other service disruptions. Considering all the possibilities that might occur in connection with train operations Frisco believes that, as control systems become more sophisticated, the railroads should be able to improve substantially their handling of cars both in single-line and joint-line service. The railroad notes, however, that service interruptions continually will be caused by such factors beyond its control as acts of God, vandalism, and labor strikes. It asserts that those deficiencies in service which are within its control can be remedied only if substantial revenues are available for the development and operation of modern information systems. For those railroads which are only marginally operated, Frisco appreciates the difficulty they experience in attempting to implement systems similar to those developed by Southern Pacific, Union Pacific, and itself.

The railroad argues that there are many causes of erratic service—many of which could never be corrected because they are not the fault of the carriers. A shipper's failure to release a loaded car prior to an established cutoff time is one such factor. In such a case, the shipment must wait until the next day that train is operated, which could be the immediately following day or 2 or 3 days later, depending on weekends and holidays. Bunching of cars is often caused, according to Frisco, by the tendency of shippers to wait until the first of the week to ship cars which would ordinarily arrive for placement on Saturday or Sunday. The difference in the respective industry's workweek and Monday national holidays are asserted to be some of the reasons for this practice. Many of the complaints about bunching are also said to be unjustified since, pursuant to average agreements, respective levies for demurrage and bunching are set off against each other.

Because so many operational variables must be considered, Frisco believes that it would be virtually impossible to publish dock-to-dock schedules. Different schedules would assertedly have to apply depending on the train, the number of cars, and the industry served. In addition, by using what it considers very conservative figures, Frisco calculates that a total of about 1.6 trillion schedule possibilities would have to be published to encompass the dock-to-dock operations performed by all of the Nation's railroads; and it argues that the impracticalities of such a proposal become impossibilities when the magnitude of the problem is examined. It estimates that at a rate of one schedule published each second, 100 persons would spend 50 years to complete the task, and that the additional requirement that notice be given where changes in schedules are to occur would further complicate an already impossible situation. Primarily because no single person or group of persons remains in continuous direct contact with each car from dockside origin to dockside destination, as is the case with the airlines or motor and water carriers, it asserts that rail service is highly susceptible to inconsistency and that, therefore, it would be impracticable to publish schedules for even the principal movements of rail traffic.

The railroad states that it will continue its practice of improving service by correcting deficiencies based upon an analysis of historical figures and that, in its opinion, it is very near to the goal of totally dependable service. According to Frisco, the rail industry does not lack motivation to provide the best possible service to the shipping public because freight revenue usually cannot be collected until after shipments have been delivered.

Frisco argues that such penalties as reverse demurrage, rate reductions, or a two-level rate system for failure to deliver within certain tolerances must be predicated upon the publication of schedules, which has been shown to be impractical and impossible. It contends that even assuming it were possible to publish all required schedules, the clerical expense necessary to administer such a system would be enormous and would, of necessity, have to be passed on to rail users in the form of higher rates.

Frisco concludes by asserting that each railroad should not be burdened by the inefficiencies of a few; that the promulgation of rules by a body which does not have daily contact with rail operations would cause more problems than it would solve; and that revenue resources will be required to take advantage of opportunities to improve service as those opportunities present themselves.

10. *Union Pacific Railroad Company* (Union Pacific) asserts that strict adherence to schedules would, in fact, cause inefficiencies in rail operations. A train could be operated so successfully as to arrive at destination station a full day ahead of schedule, and traffic on the train would be delivered concurrently with the prior day's traffic. This would precipitate a complaint of bunching or erratic service. According to Union Pacific, flexibility in schedules is essential to regulate the uneven flow of traffic which is caused, in part, by the disparities in length of industrial workweeks and seasonal factors in harvesting agricultural products.

Union Pacific estimates that the scheduling possibilities for all class I railroads would number in the billions, and that the proposal calling for the publication of dock-to-dock schedules constitute a "mind-boggling" task of distressing magnitude. Erratic service is asserted to be largely of the shipper's own making since marketing procedures such as inspection sampling, switching of selected cars, and reconsignments or diversion cause backlogs of cars and make scheduling virtually impossible. It avers that the time and expense which would be associated with the processing of reverse demurrage payments and schedule changes would be prohibitive.

Union Pacific is convinced that more efficient performance would result from carrier-initiated service programs than from the imposition of rigid schedule specifications. To substantiate this contention, it cites in its verified statements the improvements flowing from the implementation of its own computerized information system. Specifically, freight car utilization has assertedly increased by about 15 percent, thus significantly reducing its equipment investment costs. Because of its leadership in computer application, Union Pacific states that comparable systems have been adopted by the Southern Pacific, Burlington Northern, Canadian National, and Missouri Pacific. It concludes that added procedural burdens would only interfere with the achievement of the goal of quality service in a competitive system.

INITIAL STATEMENT OF THE SPECIAL PROJECTS STAFF OF THE BUREAU OF ENFORCEMENT

The statement of the Special Projects Staff (SPS), after summarizing the comments of both shippers and railroads, recommended the framework and expected results of this report. The basic nature of these expected results was that the Commission institute rulemaking proceedings dealing with certain enumerated matters.

Recommended first was a proceeding to define the duties and obligations of carriers to provide reasonable rail service under the act, including a definition of the term "reasonable dispatch" for nonperishable commodities. It was noted by the SPS that the Commission had previously instituted a proposed rulemaking proceeding with respect to defining "reasonable dispatch" of perishable commodities; Ex Parte No. 284, Investigation into the Need for Defining Reasonable Dispatch (Perishable Commodities).

SPS enumerated several factors which it felt should be examined regarding the problem of defining what is reasonable and reliable service. These factors are:

(1) What are reasonable demands to make of rail service, and are the present demands reasonable?

(2) What is the capability of the rail system to produce the service demanded?

(3) What methods can be used to measure the disparity between demand and capacity?

It was suggested that two approaches could be taken to measure the adequacy of rail service. First of these would be to measure actual overall performance against a standard of performance. The second, and recommended approach, would be to measure actual performance of each component of rail service against a standard of performance.

The framework of the proceeding would be to first identify the functional components of rail operations which contribute directly to the quality of rail service. After completing this step, the next would be to identify measures of activity for each functional component of rail service. Then the railroads would be required to document each measure of activity. From this information a determination could be made of the ability of rail carriers to develop the needed measures of activity. The last step would be to institute an action to ensure that railroads would provide the required data in a timely fashion.

The second recommendation was that the Commission should consider a change in the burden of proof requirement that a carrier must meet when route closings or cancellations are proposed. Two problems were specifically noted which it was felt resulted from circuitous routes. One of these problems was the effect on car supply resulting from increased transit times over the longer circuitous routes. The other problem noted was the decrease in reliable service as a result of longer shipment distances. To avoid service problems, such as the two just mentioned, the SPS recommended that the evidentiary rules regarding cancellation of routes be changes requiring the railroad to show that:

(1) routes to be retained are shorter and more direct than routes to be closed; and
(2) routes to be retained are less costly to operate than routes to be closed.

A showing of these two factors would then constitute prima facie evidence that the route closings proposed are reasonable. This presumption of reasonableness could be rebutted by a showing of evidence that the routes remaining open do not adequately meet shipper requirements and that the effect of route closing on the revenue of other carriers would not be offset by the economy and efficiency in operation which it would promote. The next recommendation was that the Commission require rail carriers to issue tariffs containing freight schedules. Such publication would allegedly operate as a means of communicating the importance of expeditious car movements to carrier operating people. It would also allegedly serve as a check on the information base for measurement of performance and of penalties for service failures.

In addition to the publication of service schedules the SPS suggested eight rules which would govern the modification and interpretation of the schedules. These rules are:

(1) Schedules may be changed only after proper notice in the Federal Register and only after a waiting period of thirty (30) days.

(2) Schedule changes which decrease or increase transit times by not more than 1 day are not subject to suspension.

(3) Transit times shown indicate the day of expected constructive or actual placement, or of delivery to a connecting line.

(4) Expected constructive or actual placement is determined by adding 24 hours to planned time of arrival at the destination station.

(5) Transit time calculations begin with the day following the date of acceptance by the carrier of billing instructions by the shipper, or receipt of the shipment from connecting lines.

best copy available

(6) In the event an origin or destination station is not specifically shown in the freight schedule, the next more distant station shown shall be used.

(7) Freight schedules as published apply for the type of service most prevalent between the listed origins and destinations.

(8) If service other than the most prevalent produces transit times differing by more than one day from published schedules, such variation shall be shown by schedule footnote reference.

Two other recommendations made by SPS were that the Commission eliminate the use of form BOp-105 because of shippers' reluctance to utilize the form, and that the Commission consider a change in per diem calculation to a per hour basis. The reason for the change in per diem is to increase car utilization.

In the area of car cleaning, the SPS recommended that the Commission require the railroads to provide evidence on the effect of the decision in *Consignees' Obligation to Unload Rail Cars,* 340 I.C.C. 405. It is SPS' belief that insufficient information is available to judge whether consignees have been fulfilling their obligation to unload cars completely. Additionally, SPS recommends that the Commission revise its enforcement procedure in this area, thus ensuring proper compliance by consignees.

As a final recommendation SPS states that the cost of providing an optimum level of service should be determined and accurately reflected in the appropriate freight rate structuure. SPS feels the real solution is to ensure a sufficient cash flow to induce carrier management to make the necessary investment in service, thus improving rail facilities and personnel. Therefore, it was proposed that the Commission require that the following evidence be submitted in all cases where service is at issue:

(1) carrier costs in providing satisfactory service,

(2) shipper costs involved in receiving unsatisfactory service vis-a-vis satisfactory service, and

(3) measurement of costs involved in intermodal service relationships, i.e., intermodal service cross-elasticities.

REPLIES TO THE STATEMENT OF THE SPECIAL PROJECTS STAFF

I. Railroads' reply.—The railroads' response was mainly a refutation of the recommendations made by SPS. However, on one topic the railroads and the SPS did agree. This was the effect of the inadequate rate of return which the railroads receive from their investment. Both agreed that an improvement in that rate of return was one of the keys to the provision of adequate service.

In general the railroads challenged the need for any rulemaking regarding service factors. They point to the fact that since Ex Parte Nos. 265 and 267 there have been very few service complaints in rate increase proceedings and very few complaints filed using form BOp-105, thus indicating that their efforts to improve service is paying off. With regard to form BOp-105, the railroads feel it should be kept in existence, though modified so as to provide more precise information. They feel the form is a good source of information, if properly used. With regard to car service deficiencies, the railroads stated that there was no need for a rulemaking proceeding. Their reason was that this was an area in which the railroads were already engaged in activities aimed at correcting whatever problems existed.

While the railroads do not feel any rulemaking on service is necessary, they feel that if an investigation is going to be made it should be done after the Northeast rail problem is taken care of. This, they state, is the area where the greatest service problems exist. To study service before the Congress has acted on the ConRail plan, they feel, would lead to spurious conclusions regarding rail service. They also feel that when a study of service is made, that study should be of service as a whole, not of the component parts of service. In this way more accurate conclusions can be drawn from the study.

With regard to specific service matters, the railroads feel that terminal delay complaints are not justified. They stress that the key to terminal activity is not how much time is spent, but the allocation the time spent in the terminal. They also consider bad-order complaints to be unreasonable. These complaints, they state, do not fairly relate to the needs of the customers. For example, if the need for cars is great the bad-order ratio tends to decline, however, if the need for cars is slight, the ratio tends to increase. The railroads feel there is no need to define reasonable dispatch. However, if the Commission finds otherwise, they request no action until Ex Parte No. 284 is completed. This request is made because the railroads feel the Commission has no jurisdiction in this area, and in Ex Parte No. 284 they will prove their point.

In the area of car cleaning, the railroads believe the Commission has jurisdiction and should use that power to help solve the problems that exist. However, the railroads are adamant that this is not a railroad problem and there is nothing they can do to alleviate it.

Service scheduling was the recommendation to which the railroads are most emphatically opposed. They claim the Commission has no jurisdiction over train scheduling and the railroad communication system. They cite the Chessie System's successful attack on Ex Parte No. 305 to illustrate the fact that only specific tasks, enumerated in the act, are within the Commission's jurisdiction. Their main argument against scheduling is the expense of calculating and publishing the great number of scehdules they insist will be required of them to fulfill their obligation of complete scheduling. They also attack the proposed evidentiary changes proposed by the SPS, with regard to service proceedings.

As a final point, the railroads state that possible changes in per diem are being investigated by the AAR. Therefore, they feel there is no need for the Commission to duplicate this task.

II. General Mills' reply.—General Mills again reiterated its feelings that one solution to the rail service problem is a two-level rate structure. This structure would provide the railroads with an economic incentive to provide good freight service through the payment of premium rates for reliable performance.

General Mills feels that service schedules would not be worthwhile for two reasons. First, changes in scheduling would not be quick enought to meet economic changes. Secondly, schedules would set a minimum level of service as a floor with no incentive to do better. With regard to the related topic of defining reasonable dipatch, it feels there has been no need shown for the rulemaking and that such a rulemaking would not be within the Commission's jurisdiction. It feels such a rulemaking would unwisely expand the Commission's regulatory role and drag on for years providing no relief to the problems now existent. Additionally, it feels that such a definition would impair or eliminate a major source of rail competition. It fears that the definition would lead to a decline in rail service innovation and an increase in rail-shipper compromises regarding service matters.

General Mills stated that the SPS recommendation regarding route cancellation is not novel. While not supporting the SPS recommendation, General Mills suggested that its own proposal for a proceeding similar to the recently concluded "Gateways" proceeding[3] would better solve the problem of circuitous routing. It did agree with the SPS that form BOp-105 should be eliminated as it is not utilized.

With regard to freight schedules, General Mills feels that publication is only a half-way step in the right direction. It felt that to augment the schedules some economic clout would have to be attached to the failure to meet schedules. For example, if a loss of traffic was the result of a failure to meet a schedule, the schedule might have some meaning.

Finally, with regard to per diem changes, General Mills stated that a separate rulemaking proceeding on the topic was called for.

III. Department of Transportation's reply.—DOT feels that any additional regulation of the rail industry, especially with regard to service, would be nonproductive. It favors a market determination regarding the problems of adequate service. As an example of an action which could represent a step in the direction of market determination, DOT noted its recently submitted Railroad Revitalization Act (Act). Certain provisions of that Act would allow for flexible rates and more innovation in the area of rail service.

DOT supports the SPS suggestion regarding route cancellations as being economically sound. It also believes that form BOp-105 should be abolished. However, it is opposed to freight schedules, viewing them as excessive and stifling regulation.

DOT viewed with favor changes in per diem. It suggested that a new system be phased into existence over a period of 1 year. This system would be to progressively change the unit of measurement of per diem from days, to half days, to quarter days, to hours It also noted that the car cleaning problem could be solved by placing a condition requiring cleaning in the contract between carrier and consignee. Thus, any breach would be clearly noted, with resolution of disputes to be conducted in a court of proper jurisdiction. As a final point, DOT agrees with the evidentiary standards proposed by SPS with regard to service proceedings.

APPENDIX B

Digests of respondents' periodic reports[4]

The First Quarterly Report, dated July 1, 1971, contains a preliminary statement prepared by the operations and maintenance department of the AAR. It is asserted therein that service improvements by railroads are expensive and, hence, "financial stringencies" directly affect the permissable level of investment and service quality. Although spiralling costs already have consumed the funds generated by recent freight rate increases, it is also asserted that railroads have been able to improve their equipment by increasing their debt and leasing obligations. An overall increase in railcar and locomotive capacity is reflected in the report. Figures also were submitted to reflect an increase in maintenance expenditures, train performance averages, and the number of cars repaired.

---

[3] *Gateway Elimination*, 119 M.C.C. 170 (1974).

[4] By petition filed October 2, 1972, respondents sought an amendment to this Commission's order requiring the filing of service improvement reports. Respondents asked that they be permitted to file such reports *annually* instead of quarterly. By order entered January 8, 1973, the petition was denied without prejudice to the right of renewal or the filing of another appropriate petition if and when the service deficiencies. have been ameliorated

The report describes TRAIN (Telerail Automated Information Network) which was inaugurated in 1969. Under this computerized car information system which is in the pilot stage, four railroads will exchange information as to origin and destination times of trains. This allegedly will permit freight service performance to be measured on an interline basis. The report is unclear as to the degree of participation by the program's claimed membership of 66 rail carriers.

The report contains a brief description of the ongoing trend by railroads toward the universal installation of car identification scanners. The statement then embarks upon a particularized recitation of physical plant improvements and operational changes of various lines. The operations conducted by a total of 17 railroads are touched upon in random order.

In the category of physical plant improvements statistics are submitted pertaining to new or modernized yards and terminal facilities, tracks, bridges, weigh-in-motion scales, signaling and communications, and hot box reduction and detectors. In a discussion of operational changes, the report alludes to such topics as: runthrough trains and preblocking arrangements; systems to monitor transportation performance; programs for car and power utilization; and a no-bill program. The report concludes with an assertion that continued improvement in rail service essentially depends upon the authorization of freight rate increases.

Respondent's Second Quarterly Report dated October 1, 1971, substantially consists of repetitive and oftentimes identical information as that contained in the first report. Notable exceptions are the brief preliminary statement, the omission of data pertaining to respondents' Automatic Car Identification (ACI) system and a one-page summary of pollution control projects. It is claimed that, inasmuch as major projects to improve service require several years and large sums of money to complete, the full impact of current programs upon the overall level of service quality can only be appreciated in terms of service potential for the future. It is also pointed out that during the 3 months encompassing the reporting period, 12 lines suffered work interruptions as a result of major labor disputes. Although the attention of rail management temporarily was diverted by strikes, substantial progress was made in the area of service improvement.

Car capacity, orders for new cars, and equipment maintenance expenditures increased according to figures contained in the report. Although loaded car-miles were down by 4 percent during the reporting period, train-miles per train-hour and net ton-miles per loaded car-mile increased. No significant modification in AAR's TRAIN program was envinced by the report. Categorization of operational changes and physical plant improvements essentially followed the same format as the earlier report, except in reverse order.

Respondents' Third Quarterly Report, dated January 1, 1972, is 114 pages in length and contains various references to rail improvements by about 55 carriers. In a preliminary statement the report lays blame upon this Commission for the lack of comprehensive and more relevant information in respondents' first two quarterly reports. Without contesting the conclusions reached by this Commission in our earlier report in this proceeding—that such information was "piecemeal" in nature and that present freight service by railroads was continuing deficient AAR argues that this Commission is primarily at fault for failing to specify with more particularity the desired format and content of the reports required. Also in this regard, AAR criticizes this Commission's silence—which, apparently, was taken as tacit approval—after respondents had filed their first report. Lastly, AAR argues that our order of November 5, 1971, was inconsistent and unfounded with respect to the statement concerning a lack of service-oriented motivation on the part of rail management because car capacity increased slightly; maintenance expenses increased; bad-order cars awaiting heavy repairs were down slightly; completeness and reliability of the TRAIN information system improved; a new freight car information and control study was undertaken; schedule improvements were made; and physical plant improvement projects were carried out in great number.

Information also was submitted concerning freight car and maintenance trends, operating averages, respondents' TRAIN system, a freight car information and control study, operational changes, and physical plant improvements.

The Fourth Quarterly Report, dated April 1, 1972, indicates that, although the overall number of railcars declined, aggregate tonnage capacity of new cars exceeded that of the cars retired. According to incomplete data, total maintenance expenses in the last quarter of 1971 were 15 percent above those of the fourth quarter of 1970. On a regional basis, however, maintenance expenditures were down in the East because of coal and dock strikes. Operating averages show that respondents' average car-miles per train-mile for 1971 was 67.9, down 2.1 from 1970's figure. Train-miles per train-hour and net ton-miles per loaded car-mile increased slightly in 1971. No significant change was reported in respondents' TRAIN system. Operational changes and physical plant improvements reported are similar to those in the three prior reports. AAR contends that, although not all of the enumerated projects lend themselves individually to a quantifiable measure of their impact on service, they nevertheless form essential parts on a working whole.

The Fifth Quarterly Report, dated July 1, 1972, consists of 111 pages. It reveals that respondents have inaugurated programs to improve their control and distribution of freight cars by the acquisition of electronic data processing equipment. In the first quarter of 1972 the national average for expenditures for maintenance and improvements increased 3.2 percent. Compared to the first quarter of 1971, gross capital expenditures by all railroads increased 52.1 percent. Operating statistics continue to reflect a trend toward lighter average freight trains composed of fewer but larger cars.

The report also indicates that in June 1972, AAR's board of directors authorized a design for a nationwide computerized freight car information system to be monitored by the AAR in Washington. It is scheduled to be operational in 1974. Its purpose is to enhance the industry's ability to function on a national basis by improving car utilization. According to the report the system represents a significant supplementation of TRAIN, made possible by the heavy investment in communications systems by individual lines. Railroads are continuing to install ACI scanners and make numerous other specified improvements in operational techniques and physical plant designs.

Respondents' Sixth Quarterly Report is dated October 1, 1972. It reveals that a record traffic volume was handled by respondents without significant car shortages and that the tonnage would have been higher had Hurricane Agnes not occurred. For the second quarter of 1972, spending for maintenance (exclusive of depreciation, retirement, and equalization charges) amounted to $916 million, 11.3 percent higher than first quarter expenditures. Capital expenditures for the year 1971 rose by $88 million, a 14.5-percent increase. Respondents estimate that capital spending for 1972 will rise an additional 8 percent.

This report also indicates that the trend toward shorter freight trains composed of fewer but larger cars is continuing. Freight car utilization assertedly was improved inasmuch as a record volume was handled by the railroads in the first 6 months of 1972 without the development of serious freight car shortages.

Analysis of respondents' expanded freight car information system (TRAIN) is made by an ad hoc committee of the data systems division of AAR. It is estimated that the committee will complete its task in 6 to 8 months. Specific improvements in operations and physical plant have been undertaken by certain lines.

Respondent's Seventh Quarterly Report, dated January 1, 1973, generally follows the same organizational format established in prior reports.

For the first 9 months of 1972, maintenance expenditures rose by 4.2 percent over the outlay for the same period in 1971. Capital expenditures increased by 5.6 percent over the same period. During 1972 an alltime record volume of freight traffic was handled with fewer cars than ever before. This gain is attributed to increased car capacity, faster turnaround times, and higher demurrage charges. The report states that the national car information system (TRAIN) is continuing to improve on the timeliness of reporting and the completeness of reporting cars moving in interchange between railroads. It has been expanded to include the reporting of interchange receipts as well as deliveries.

A design study is now under way to include new and expanded informational elements such as data input on car transactions and waybills, message switching, car location messages, and car service output. A number of specific improvements were listed for various railroads.

The Eighth Quarterly Report, dated April 1, 1973, contains a section bearing the caption *Freight Car Information Systems,* but the one-half page of discussion merely contains repetition of prior reports.

Industry expenditures for maintenance of way and equipment, exclusive of depreciation and retirements, totaled $3,476 million in 1972, $135 million more than the amount spent in 1971. Capital spending rose to $1,243 million in 1972, a gain of 5.6 percent over 1971. Class I railroads added 36,994 new and rebuilt cars in 1972, and private car companies and other railroads installed 13,127 cars, making a total of 50,121 new or rebuilt additions to the car fleet. Class I railroads reported the installation of 1,550 new and rebuilt locomotive units.

Net ton-miles per freight car day reached a record of 1,481 in 1972, 7.6 percent over the 1971 average. This improvement assertedly is the result of improvements in daily car mileage and average load per car. Car mileage reached a record 56.1 miles per day in 1972, 5.1 percent over the 1971 average, while tons per car measured by net ton-miles per loaded car-mile rose to an alltime high of 46.7 tons. Freight car utilization has improved, according to the report, because of the fact that the railroads handled an industry record 778 billion ton-miles or revenue freight in 1972. Average freight car capacity rose to 69.5 tons, 1.5 tons per car higher than the 1971 average.

APPENDIX C

Suggested rules and regulations pertaining to the establishment of service schedules and examples of existing service schedules

1. Schedules may be changed only after proper notice in the Federal Register and only after a waiting period of thirty (30) days.

2. Schedule changes which decrease or increase transit times by not more than 1 day are not subject to suspension.

3. Transit times shown indicate the day of expected constructive or actual placement, or of delivery to a connecting line.

4. Expected constructive or actual placement is determined by adding 48 hours to planned time of arrival at the destination station.

5. Transit time calculations begin with the day following the date of acceptance by the carrier of billing instructions by the shipper, or receipt of the shipment from connecting lines.

6. In the event an origin or destination station is not specifically shown in the freight schedule, the next more distant station shown shall be used.

7. Freight schedules as published apply for the type of service most prevalent between the listed origins and destinations.

8. If service other than the most prevalent produces transit times differing by more than 1 day from published schedules, such variation shall be shown by schedule footnote reference.

FREIGHT SCHEDULES

(SUBJECT TO CHANGE WITHOUT NOTICE)

HOW TO FIND THE TRANSIT TIME BETWEEN TWO CITIES IN THE NUMBERED LIST SHOWN: The first number shown in these tables is the origin, or the 'from' point, and the second number is the destination or the point 'to' which service is shown. Example: From Chicago (No. 2) to Denver (No. 5) the service is second morning and will be shown as "2 - 5 2nd MORNING."

Abbreviations: **Morning = MORN.** **Afternoon = AFT.** **Evening = EVE.**

POINTS FROM & TO WHICH SERVICE IS SHOWN

1. Amarillo, TX
2. Chicago, IL
3. Co. Bluffs (Omaha, NE) IA
4. Dallas/Ft. Worth, TX
5. Denver, CO
6. Des Moines, IA
   Ft. Worth/Dallas, TX (4)
7. Houston, TX
8. Kansas City, MO/KS
9. Little Rock, AR
10. Los Angeles, CA
11. Memphis, TN
12. Minneapolis/St. Paul, MN
13. Oklahoma City, OK
    Omaha, NE (Co. Bluffs, IA) (3)
14. Peoria, IL
15. San Francisco/Oakland, CA
16. St. Louis, MO
    St. Paul/Minneapolis, MN (No. 12)
17. Topeka, KS
18. Tucumcari, NM (RI/SP Run-Through)
19. Wichita, KS

ROUTE REFERENCES. ROCK ISLAND DIRECT EXCEPT AS NOTED BY REFERENCE ( ) MARKS.

(A) RI-Tucumcari-SP
(B) RI-Denver-DRGW-WP
(C) RI-Denver-DRGW-SP
(D) RI-Amarillo-ATSF
(E) SP-Tucumcari-RI
(F) ATSF-Amarillo-RI
(G) WP-DRGW-Denver-RI
(H) SP-DRGW-Denver-RI

Table 1—

1– 2	3rd AFT.
1– 4	Next EVE.
1– 6	5th MORN.
1– 7	2nd EVE.
1– 8	3rd MORN.
1– 9	Next EVE.
1–10	2nd EVE.(A)
1–11	2nd MORN.
1–12	4th MORN.
1–13	Next MORN.
1–14	4th MORN.
1–15	4th MORN.(A)
1–16	4th MORN.
1–17	3rd EVE.
1–18	Next MORN.
1–19	Next EVE.
5– 1	3rd AFT.
5– 2	2nd AFT.
5– 3	Next EVE.
5– 4	3rd EVE.
5– 6	Next EVE.
5– 7	4th MORN.
5– 8	Next EVE.
5– 9	3rd EVE.
5–11	4th MORN.
5–12	3rd MORN.
5–13	2nd EVE.
5–14	3rd MORN.
5–16	2nd MORN.
5–17	2nd EVE.
5–19	2nd EVE.
9– 1	Next EVE.
9– 2	4th AFT.
9– 3	4th EVE.
9– 4	2nd EVE.
9– 5	5th MORN.
9– 6	4th AFT.
9– 7	3rd MORN.
9– 8	3rd MORN.
9–10	3rd MORN.(D) 3rd EVE.(A)
9–11	Next MORN.
9–12	5th MORN.
9–13	Next MORN.
9–14	4th AFT.
9–15	4th EVE. (D) 5th MORN.(A)
9–17	3rd AFT.
9–18	2nd MORN.
12–15	5th MORN.(A) 4th EVE.(B)(C)
12–16	2nd MORN.
12–17	2nd EVE.
12–18	2nd EVE.
12–19	2nd EVE.
13– 1	Next EVE.
13– 2	3rd AFT.
13– 3	3rd EVE.
13– 4	Next EVE.
13– 5	4th MORN.
13– 6	3rd AFT.
13– 7	3rd MORN.
13– 8	3rd MORN.
16– 1	3rd AFT.
16– 3	2nd EVE.
16– 4	2nd EVE.
16– 5	2nd MORN.
16– 6	2nd MORN.
16– 7	3rd AFT.
16– 8	Next MORN.
16–10	3rd EVE.(A)
16–12	3rd MORN.
16–13	2nd AFT.
16–15	4th EVE.(B)(C) 5th MORN.(A)
16–17	Next EVE.
16–18	2nd EVE.
16–19	2nd MORN.

2— 1	2nd EVE.
2— 3	Next MORN.
2— 4	2nd EVE.
2— 5	2nd MORN.
2— 6	Next MORN.
2— 7	3rd MORN.
2— 8	Next AFT.
2— 9	3rd EVE.
2—10	2nd EVE.
2—12	2nd MORN.
2—13	3rd MORN.
2—14	Next MORN.
2—15	3rd EVE.(B) 3rd EVE.(C) 4th MORN.(A)
2—17	2nd MORN.
2 18	Next EVE.
2 19	3rd MORN.
3 1	4th AFT.
3 2	Next AFT.
3 4	3rd EVE.
3 5	Next EVE.
3 6	Next MORN.
3 7	4th EVE.
3 8	2nd EVE.
3 9	3rd EVE.
3 10	4th EVE.(A)
3 11	5th MORN.
3 12	2nd MORN.
3 13	3rd MORN.
3 14	2nd MORN.
3 15	3rd EVE.(B)(C)
3 16	3rd MORN.
3 17	2nd EVE.
3—18	3rd EVE.
3 19	2nd EVE.
4 1	Next EVE.
4 2	3rd MORN.
4 3	3rd AFT.
4 5	4th MORN.
4 6	3rd MORN.
4 7	Next EVE.
4 8	2nd MORN.
4 9	2nd EVE.
4—10	4th MORN.(D) 4th EVE.(A)
4—11	3rd MORN.
4—12	3rd MORN.
4—13	2nd AFT.
4—14	3rd MORN.
4—15	5th EVE.(D) 6th MORN.(A)
4—16	3rd MORN.
4—17	2nd EVE.
4—18	3rd MORN.
4—19	2nd MORN.
6— 1	3rd EVE.
6— 2	Next AFT.
6— 3	Same EVE.
6— 4	2nd EVE.
6— 5	2nd MORN.
6— 7	3rd MORN.
6— 8	Same EVE.
6— 9	3rd EVE.
6—10	2nd EVE.(A)
6—11	4th MORN.
6—12	Next MORN.
6—13	2nd AFT.
6—14	2nd MORN.
6—15	3rd EVE.(B)(C)
6—16	2nd MORN.
6—17	Next EVE.
6—18	Next EVE.
6—19	Next EVE.
7— 1	3rd EVE.
7— 2	3rd MORN.
7— 3	4th AFT.
7— 4	Next EVE.
7— 5	5th MORN.
7— 6	3rd EVE.
7— 8	3rd MORN.
7— 9	3rd EVE.
7—10	5th MORN.(D) 5th EVE.(A)
7—11	4th MORN.
7—12	4th MORN.
7—13	3rd MORN.
7—14	4th MORN.
7—15	6th EVE.(D) 7th MORN.(A)
7—16	4th MORN.
7—17	3rd EVE.
7—18	4th MORN.
7—19	2nd EVE.
8— 1	2nd EVE.
8— 2	2nd MORN.
8— 3	Next EVE.
8— 4	Next EVE.
8— 5	Next MORN.
8— 6	Next MORN.
8— 7	2nd MORN.
8— 9	2nd EVE.
8—10	2nd EVE.(A)
8—11	4th MORN.
8—12	2nd MORN.
8—13	Next AFT.
8—14	2nd MORN.
8—15	4th MORN.(A) 3rd EVE.(B)(C)
8—16	Next MORN.
8—17	Same EVE.
8—18	Next EVE.
8—19	Next MORN.
9—19	2nd EVE.
10— 1	3rd EVE. (E)
10— 2	4th AFT. (E)
10— 3	4th EVE. (E)
10— 4	4th EVE. (E)(F)
10— 6	4th AFT. (E)
10— 7	5th EVE. (E)(F)
10— 8	3rd MORN.(E)
10— 9	4th EVE. (E)
10—11	5th MORN.(E)(F)
10—12	5th MORN.(E)
10—13	4th MORN.(E)(F)
10—14	6th MORN.(E)
10—16	6th MORN.(E)
10—17	3rd AFT. (E)
10—19	3rd AFT. (E)
11— 1	Next EVE.
11— 3	4th EVE.
11— 4	2nd EVE.
11 5	5th MORN.
11 6	3rd AFT.
11 7	3rd MORN.
11 8	3rd MORN.
11 9	Next MORN.
11 10	3rd MORN.(D) 3rd EVE.(A)
11—12	5th MORN.
11—13	2nd MORN.
11—15	4th EVE.(D) 5th MORN.(A)
11—17	3rd EVE.
11—18	2nd MORN.
11—19	2nd EVE.
12— 1	3rd AFT.
12— 2	2nd MORN.
12— 3	2nd MORN.
12— 4	3rd EVE.
12— 5	3rd MORN.
12— 6	Next AFT.
12— 7	4th MORN.
12— 8	Next EVE.
12— 9	4th AFT.
12—10	3rd EVE.(A)
12—11	5th MORN.
12—13	3rd EVE.
12—14	2nd MORN.
13— 9	Same EVE.
13—10	3rd MORN.(D) 3rd EVE.(A)
13—11	Next MORN.
13—12	4th MORN.
13—14	4th MORN.
13—15	4th EVE.(D) 5th MORN.(A)
13—16	4th MORN.
13—17	2nd EVE.
13—18	2nd MORN.
13—19	Next EVE.
14— 1	3rd EVE.
14— 2	Next MORN.
14— 3	2nd MORN.
14— 4	3rd EVE.
14— 5	3rd MORN.
14— 6	2nd MORN.
14— 7	4th MORN.
14— 8	2nd MORN.
14— 9	4th AFT.
14—10	3rd EVE.(A)
14—11	5th MORN.
14—12	3rd MORN.
14—13	3rd EVE.
14—15	4th EVE.(B)(C) 5th MORN.(A)
14—17	3rd MORN.
14—18	2nd EVE.
14—19	3rd MORN.
15— 1	4th EVE. (E)
15— 2	4th AFT. (G)(H) 6th MORN.(E)
15— 3	3rd EVE. (G)(H)
15— 4	4th EVE. (F) 5th EVE. (E)
15— 6	4th MORN.(G)(H)
15— 7	5th EVE. (F) 6th EVE. (E)
15— 8	3rd EVE. (G)(H) 5th MORN.(E)
15— 9	4th EVE. (F) 5th EVE. (E)
15—11	5th MORN.(F) 6th MORN.(E)
15—12	6th MORN.(G)(H) 7th MORN.(E)
15—13	4th MORN.(F) 5th MORN.(E)
15—14	5th MORN.(G)(H) 6th MORN.(E)
15—16	4th MORN.(G)(H) 6th MORN.(E)
15—17	4th MORN.(G)(H) 5th MORN.(E)
15—19	4th EVE. (G)(H) 5th EVE. (E)
17— 1	3rd AFT.
17— 2	2nd AFT.
17— 3	2nd AFT.
17— 4	2nd EVE.
17— 5	2nd MORN.
17— 6	2nd AFT.
17— 7	2nd EVE.
17— 8	Same DAY.
17— 9	2nd EVE.
17—10	3rd EVE.(A)
17—11	4th MORN.
17—12	3rd MORN.
17—13	3rd MORN.
17—14	3rd MORN.
17—15	5th MORN.(A)
17—16	2nd MORN.
17—18	2nd EVE.
17—19	2nd MORN.
18— 1	Same DAY.
18— 2	2nd MORN.
18— 3	2nd EVE.
18— 4	Next EVE.
18— 6	2nd AFT.
18— 7	3rd MORN.
18— 8	Next MORN.
18— 9	Next EVE.
18—11	2nd MORN.
18—12	3rd MORN.
18—13	Next MORN.
18—14	2nd MORN.
18—16	2nd MORN.
18—17	2nd MORN.
18—19	2nd MORN.
19— 1	Next EVE.
19— 2	3rd AFT.
19— 3	2nd EVE.
19— 4	Next EVE.
19— 5	3rd MORN.
19— 6	2nd EVE.
19— 7	3rd MORN.
19— 8	2nd MORN.
19— 9	2nd AFT.
19—10	3rd EVE.(A)
19—11	3rd MORN.
19—12	3rd MORN.
19—13	Next AFT.
19—14	3rd MORN.
19—15	5th MORN.(A) 5th EVE.(B)(C)
19—16	3rd MORN.
19—17	Next EVE.
19—18	2nd EVE.

Chessie System

Chesapeake and Ohio Railway **Baltimore and Ohio Railroad**

CHESSIE SYSTEM FREIGHT SCHEDULES
Continued

THROUGH SERVICE TRAINS

(CO-CCO-SCL)

Table—7 CHICAGO-CINCINNATI-TOLEDO-ELKHORN CITY GATEWAY

TRAIN	TIME	DAY	TRAIN	TIME	DAY				TRAIN	TIME	DAY	TRAIN	TIME	DAY
90	1030 P	0	92	1030 A	0	LV	Chicago, IL *(C.T.)*	AR	91	1015 A	2	91	1015 A	2
90	400 P	1	92	530 A	1	LV	Cincinnati, OH *(E.T.)*	LV	91	915 P	1	91	915 P	1
190	1000 A	1	192	700 P	0	LV	Toledo, OH	AR	97	515 A	2	97	515 A	2
190	530 A	2	192	700 P	1	AR	Elkhorn City, KY	LV	97	445 A	1	97	445 A	1
CR94	1150 P	2	CR92	115 P	2	AR	Spartanburg, SC	LV	CR97	220 P	0	CR93	930 A	0
393	1230 A	4	393	1230 A	3	AR	Savannah, GA *(E.T.)*	LV	398	200 A	0			

(CO)

Table—8 CHICAGO-DETROIT-BUFFALO

TRAIN	TIME	DAY	TRAIN	TIME	DAY				TRAIN	TIME	DAY	TRAIN	TIME	DAY
42	130 P	0	44	1230 A	0	LV	Chicago, IL *(C.T.)*	AR	31	715 A	2	37	1030 P	1
42	1000 P	0	44	1045 A	0	AR	Grand Rapids, MI *(E.T.)*	AR	31	700 P	1	37	730 A	1
42	420 A	1	44	100 A	1	AR	Detroit, MI	LV	31	1201 P	1	37	1100 P	0
42	115 P	1	44	500 A	1	LV	Detroit, MI	AR	31	500 A	1	37	515 P	0
42	1100 P	1	44	800 P	1	AR	Buffalo, NY *(E.T.)*	LV	31	1000 A	0	37	100 A	0

CHICAGO GATEWAY RUN THRU TRAIN SERVICE

Table—9 (CO-MILW)
BENSENVILLE-GRAND RAPIDS

TRAIN	TIME	DAY				TRAIN	TIME	DAY
204	745 P	0	LV	Bensenville IL (MILW), *(C.T.)*	AR	203	1015 A	0
204	700 A	1	AR	Grand Rapids, MI *(E.T.)*	LV	203	1245 A	0

Table—10 (CO-CNW)
BUFFALO-DETROIT-GRAND RAPIDS-CHICAGO

TRAIN	TIME	DAY			
31	1000 A	0	LV	Buffalo, NY *(ET)*	
31	1201 P	1	LV	Detroit, MI	
201	500 A	2	LV	Grand Rapids, MI *(ET)*	
201	100 P	2	AR	Chicago, IL *(CT)*	

Table—12 (CO-RI-ICG)
MARKHAM-DETROIT

TRAIN	TIME	DAY	TRAIN	TIME	DAY				TRAIN	TIME	DAY	TRAIN	TIME	DAY
154	845 A	0	158	945 P	0	LV	Markham, IL *(CT)*	AR	155	1000 A	1	157	100 A	2
154	1100 A	0	158	1145 P	0	LV	South Chicago, IL *(CT)*	AR	155	730 A	1	157	1015 P	1
154	530 P	0	158	800 A	1	AR	Grand Rapids, MI *(ET)*	LV	155	220 A	1	157	1000 A	1
154	1100 P	0				LV	Grand Rapids, MI	AR				157	900 A	1
154	900 A	1				AR	Flint, MI	LV				157	1201 A	1
						AR	Saginaw, MI	LV						
42	530 A	1	44	100 A	2	AR	Detroit, MI *(ET)*	LV	35	600 A	0	37	1100 P	0

TRAILER SERVICE—RAMP LOCATIONS

AKRON, OH
BALTIMORE, MD
BENTON HARBOR, MI
CHARLESTON, WV
CHICAGO, IL
CHILLICOTHE, OH
CINCINNATI, OH
CLEVELAND, OH
COLUMBUS, OH
CONNERSVILLE, IN
DAYTON, OH
DETROIT, MI
EAST ST. LOUIS, IL
ELIZABETHPORT, NJ
FLINT, MI
GRAND RAPIDS, MI
HUNTINGTON, WV
INDIANAPOLIS, IN
LANSING, MI
LIMA, OH
LOUISVILLE, KY
(JEFFERSONVILLE, IN)
LYNCHBURG, VA
MIDLAND, MI
NEWARK, OH
NEWPORT NEWS, VA
NORFOLK, VA
PARKERSBURG, WV
PHILADELPHIA, PA
PITTSBURGH, PA
PORTSMOUTH, VA
RICHMOND, IN
RICHMOND, VA
SAGINAW, MI
STAUNTON, VA
TOLEDO, OH
WASHINGTON, DC
WHEELING, WV
WILMINGTON, DE
YOUNGSTOWN, OH

C.T.-Central time E.T.-Eastern time,

SCHEDULES SUBJECT TO CHANGE.

BURLINGTON NORTHERN

CONDENSED FREIGHT SCHEDULES

All Trains Handle both TOFC and Carload Traffic

Table—1 PACIFIC NORTHWEST TO TWIN CITIES-CHICAGO
(and intermediate points including service Twin Cities to St. Louis, Chicago)

		4[3]	82[1]	88	182	80[2]	172[4]	86	130[4]	174	137
Vancouver, B.C.	LV										300 P -0
Tacoma, WA	LV								200 P -0		↓
Seattle, WA	LV	730 P -0	1201 A -1	800 A -1					400 P -0		↓
Portland, OR	LV	↓	↓	↓		815 A -1			↓		↓
Auburn, WA	LV	↓	↓	↓		↓			↓	300 P -0	↓
Yakima, WA	AR	↓	↓	↓		↓			↓	930 P -0	↓
Yakima, WA	LV	↓	↓	↓		↓			↓	1130 P -0	↓
Vancouver, WA	LV	↓	↓	↓		1030 A -1			↓	↓	↓
Pasco, WA	AR	↓	↓	↓		600 P -1			↓	230 A -1	↓
Pasco, WA	LV	↓	↓	↓	830 A -1	1201 A -2			↓	500 P -1	↓
Everett, WA	LV	↓	130 A -1	730 A -1	↓	↓			↓	↓	1045 P -0
Wenatchee, WA	AR	↓	630 A -1	200 P -1	↓	↓			1100 P -0	↓	
Wenatchee, WA	LV	↓	700 A -1	300 P -1	↓	↓			100 A -1	↓	
Lewiston, ID	LV	↓	↓	↓	↓	↓	500 A -1		↓	↓	
Spokane, WA	AR	↓	1201 P -1	900 p -1	↓	420 A -2	100 P -1		700 A -1	130 A -2	
Spokane, WA	LV	630 A -1	130 P -1	1130 P -1	105 P -1	550 A -2	600 P -1		900 A -1	200 A -2	
Missoula, MT	LV	↓	↓	↓	↓	↓	↓	930 P -0	↓	1000 P -2	
Laurel, MT	AR	↓	↓	↓	↓	↓	↓	825 A -1	↓	100 P -3	
Laurel, MT	LV	↓	↓	↓	↓	↓	↓	1040 A -1	↓		
Whitefish, MT	AR	↓	↓	900 A -2	↓	350 P -2	500 A -2	↓	800 P -1		
Havre, MT	AR	↓	↓	↓	↓	↓	530 P -2	↓	1000 A -2		
Minot, ND *(Gavin)*	AR	↓	300 p -2	1100 A -3	430 P -2	100 P -3	1100 A -3	↓	500 A -3		
Minot, ND *(Gavin)*	LV	↓	845 P -2		1015 P -2	930 P -3	1230 A -4	↓			
Minneapolis-St. Paul, MN	AR	355 P -2	815 A -3		945 A -3	900 A -4	715 P -4	230 P -2			
							98		182	58[3]	352
Minneapolis-St. Paul, MN	LV	440 P -2	↓		1100 A -3	115 P -4	1100 A -1	930 P -2	800 P -0	400 A -1	100 A -1
Savanna, IL	AR	↓	↓		↓	845 P -4	830 P -1	↓	745 A -1	315 P -1	1100 A -1
Savanna, IL	LV	↓	↓		↓	900 P -4	845 P -1	↓	845 A -1	345 P -1	200 P -1
Galesburg, IL	AR	↓	↓		↓	230 A -5	↓	↓	↓	830 P -1	800 P -1
Galesburg, IL	LV	↓	↓		↓		↓	↓	↓	330 P -2	
Beardstown, IL	AR	↓	↓		↓		↓	↓	↓	↓	
Centralia, IL	AR	↓	↓		↓		↓	↓	↓	↓	
North St. Louis, MO	AR	↓	↓		↓		↓	↓	↓	1145 P -2	

Chicago, IL	AR	415 A -3	1115 P -3		1230 A -4		300 A -2	130 P -3	130 P -1		

1 From Tacoma, WA, TOFC highwayed to Seattle, WA, for Train 82.
2 Connects at Galesburg, IL with ICG, LN and SOUrun-throughs shown in Tables 9A, 9B and 9C.
3 Daily, except Saturday, Sunday and holidays.
4 Daily, except Monday.

Table—1A CHICAGO-ST. LOUIS-TWIN CITIES TO PACIFIC NORTHWEST (and intermediate points including service Chicago, St. Louis to Twin Cities)

		3	97	197	83	81	85	181	185	57	58[5]
Chicago, IL	LV	900 A -1	1100 A -1	1100 A -1			810 P -0	100 A -1	830 P -0		
N. St. Louis, MO	LV	↓	↓	↓			↓	↓	↓		930 P -0
Galesburg, IL	AR	↓	↓	↓			↓	↓	↓		830 A -1
Galesburg, IL	LV	↓	↓	↓			↓	↓	↓	830 P -0	430 P -1
Savanna, IL	AR	↓	↓	↓			1120 P -0	900 A -1	1145 P -0	130 A -1	930 P -1
Savanna, IL	LV	↓	↓	↓			1125 P -0	600 P -1	1201 A -1	200 A -1	1000 P -1
Minneapolis-St. Paul, MN	AR	850 P -1	↓	↓			845 A -1	345 A -2	745 A -1	1000 A -1	845 A -2
Minneapolis-St. Paul, MN	LV	750 P -1	↓	↓	630 P -0	600 A -1	1245 P -1			200 P -1	
Minot, ND *(Gavin)*	AR	500 A -2	1000 A -2	1000 A -2	645 A -1	300 A -2	↓			400 A -2	
Minot, ND *(Gavin)*	LV	↓	100 P -2	200 P -2	430 P -1	730 A -2	↓				
Havre, MT	LV	1240 P -2	↓	↓	500 A -2	300 A -3	↓				
Whitefish, MT	LV	↓	↓	↓	300 P -2	230 P -3	↓				
Jamestown, ND	LV	↓	↓	↓	↓	↓	900 P -1				
Tacoma, WA	Ar	↓	↓	↓	↓	↓					
Billings, MT	LV	↓	↓	↓	↓	↓	1115 A -2				
Laurel, MT	AR	↓	↓	↓	↓	↓	1145 A -2				
Laurel, MT	LV	↓	↓	↓	↓	↓	300 P -2				
Missoula, MT	LV	↓	↓	↓	↓	↓	830 A -3				
Spokane, WA	AR	1110 P -2	955 A -3	1040 A -3	1000 P -2	1210 A -4	530 P -3				
Spokane, WA	LV	↓	1005 A -3	1050 A -3	1130 P -2	200 A -4	700 P -3				
Wenatchee, WA	AR	↓	↓	↓	500 A -3	↓	↓				
Wenatchee, WA	LV	↓	↓	↓	600 A -3	↓	↓	No. 138			
Everett, WA	AR	↓	855 P -3	↓	100 P -3	↓	↓	1030 P -0			
Seattle, WA	AR	900 A -3	800 P -3	↓	200 P -3	↓	↓	↓			
Vancouver, B.C.	AR	↓		↓		↓	↓	630 A -1			
Pasco, WA	AR	↓		250 P -3		700 A -4	1145 P -3			No. 175	
Pasco, WA	LV	↓		320 P -3						500 P -0	
Vancouver, WA	AR	↓		815 P -3						↓	
Yakima, WA	AR	↓		↓						720 P -0	
Yakima, WA	LV	↓		↓						735 P -0	
Auburn, WA	AR	↓		↓						200 A -1	
Portland, OR	AR	530 P -3		1000 P -3						↓	
Seattle, WA	AR									500 A -1	

5 Connects with Train 57 at Galesburg for through service from St. Louis to Pacific Northwest via Minot connections with Trains 97 or 197.

BURLINGTON NORTHERN

CONDENSED FREIGHT SCHEDULES—Continued

All Trains Handle both TOFC and Carload Traffic

Table—2 BETWEEN KANSAS CITY AND PACIFIC NORTHWEST
(and intermediate points including service between St. Louis and Kansas City-Denver)

379	71[1]	177	79	77	75				76	76-188	188	178	72	380
						LV	North St. Louis, MO	AR					200 P -1	
	1000 P -0					LV	East St. Louis, IL	AR					↑	
	400 A -1					AR	Hannibal, MO	LV						
	600 A -1					LV	Hannibal, MO	AR					500 A -1	
	↓					AR	Kansas City, MO	LV					↑	
1030 P -1			630 P -0		800 A -1	LV	Kansas City, MO	AR	300 P -3	430 A -4	430 A -4	800 P -3		900 A -1
1215 A -1	100 P -1		815 P -0		945 A -1	AR	St. Joseph, MO	AR	↑	↑	↑	500 P -3	815 P -0	530 A -1
1000 A -1	600 P -1		215 A -1		255 P -1	AR	Lincoln, NE	LV	830 A -3		955 P -3	1201 P -3	130 P -0	1000 P -0
	800 P -1	400 A -1	500 A -1		455 P -1	LV	Lincoln, NE	AR	630 A -3		800 P -3	430 A -3		
	↓	445 P -1	200 P -1		225 A -2	AR	Alliance, NE	LV	↑		955 A -3	445 P -2		
		745 P -1	300 P -1		315 A -2	LV	Alliance, NE	AR			840 A -3	245 P -2		
		630 A -2	↓		↓	AR	Casper, WY	AR			↑	1130 P -1		
	600 A -2	↓				AR	Denver, CO	LV				↑		
		230 A -3	905 A -2		900 P -2	AR	Laurel, MT	LV	730 A -2	230 P -2	530 P -2	800 A -1		
			105 P -2	105 A -3	1100 P -2	LV	Laurel, MT	AR	550 A -2	130 P -2	230 P -2			
			115 A -3	↓	1035 A -3	AR	Missoula, MT	LV	↑	↑	300 A -2			
			845 A -3	930 P -3	540 P -3	AR	Spokane, WA	LV	1145 A -1	500 P -1	600 P -1			
			1000 A -3	↓	550 P -3	LV	Spokane, WA	AR	1125 A -1	200 P -1	530 P -1			
			↓	530 A -4	↓	AR	Wenatchee, WA	LV	↑	900 A -1	↑			
				1145 A -4		AR	Everett, WA	LV		300 A -1				
				100 P -4		AR	Seattle, WA	LV		130 A -1				
			300 P -3		335 P -3	AR	Pasco, WA	LV	730 A -1		100 P -1			
					100 A -4	LV	Pasco, WA	AR	330 A -1		730 A -1			
					800 A -4	AR	Vancouver, WA	LV	900 P -0		100 A -1			
					1000 A -4	AR	Portland, OR	LV	830 P -0		↑			
						AR	Hoquiam, WA	LV			430 P -0			

[1] Connects at Denver with DRGW for California.

Table—3 BETWEEN PACIFIC NORTHWEST AND DENVER-TEXAS
(and intermediate points)

	186¹	152	168	76	78				77	79	75	309	151	187²
					130 A -1	LV	Seattle, WA	AR	100 P -8					
					900 A -1	LV	Wenatchee, WA	AR	450 A -8					
				630 P -0	↓	LV	Portland, OR	AR	↑		1000 A -6			
			430 P -0	↓	↓	LV	Hoquiam, WA	AR	↑		↓	200 A -2		
			730 A -1	330 A -1	↓	AR	Pasco, WA	LV	↑		100 A -6	100 A -1		
			100 P -1		↓	LV	Pasco, WA	AR	↑	300 P -6	935 P -5			
			600 P -1		500 P -1	LV	Spokane, WA	AR	920 P -5	845 A -6	540 P -5			
			230 P -2		130 P -2	AR	Laurel, MT	LV	105 A -5	105 P -5	1100 P 4			
					600 P -2	LV	Laurel, MT	AR	905 P -4					
					830 A -3	LV	Casper, WY	LV	1000 A -4					
					1130 A -3	LV	Wendover, WY	LV	415 A -4					
		500 P -0			1100 P -3	LV	Denver, CO	AR	1159 A -3				130 A -3	
		300 A -1			1100 A -4	LV	Pueblo, CO	LV	700 A -3				930 P -2	
		830 P -1			230 A -5	LV	Amarillo, TX	LV	500 P -2				730 A -2	
	800 P -0	↓			↓	LV	Lubbock, TX	AR	↑				↑	600 A -1
	500 A -1	↓			545 A -5	AR	Childress, TX	LV	1000 A -2				130 P -2	1159 P -0
		130 A -2			610 A -5	LV	Childress, TX	AR	850 A -2				1100 P -1	
		↓		No. 1411 M-W-F	↓				↑	No. 1412 T-T-S			↑	
		530 A -2			920 A -5	AR	Wichita Falls, TX	LV	815 A -2				630 P -1	
		900 A -2		100 A -1	1236 P -5	LV	Wichita Falls, TX	AR	545 A -2	400 A -1			130 P -1	
		↓		100 P -1	↓	AR	Abiline, TX	LV	↑	400 P -0	82M		↓	
		100 P -2			400 P -5	AR	Fort Worth, TX	LV	230 A -2				800 A -1	
					600 P -5	LV	Fort Worth, TX	AR	1201 A -2		1245 P -1			
					830 P -5	LV	Irving, TX	LV	1015 P -1		1045 A -1			
					1000 P -5	LV	Dallas, TX	LV	915 P -1		1000 A -1			
					↓	LV	Waxahachie, TX	LV	↑		↑			
					200 A -6	AR	Teague, TX	LV	430 P -1		800 A -1			
					500 A -6	LV	Teague, TX	AR	100 P -1		230 A -1			
					1130 A -6	LV	Basin, TX	LV	700 A -1		730 P -0			
					1201 P -6	AR	Houston, TX	LV	600 A -1		630 P -0			
					1100 P -6	AR	Galveston, TX	LV	100 A -1					

1 Daily, except Saturday.
2 Daily, except Sunday.

Table—4 BETWEEN CHICAGO AND DENVER-WEST COAST
(and intermediate points)

		63	183				64-184	178		
		830 P -0	800 A -1	LV	Chicago, IL *(Cicero)*	AR	130 A -2	900 A -2		
		935 P -0	905 A -1	AR	Galesburg, IL	LV	1000 P -1	500 A -2		
		950 P -0	945 A -1	LV	Galesburg, IL	AR	845 P -1	1100 P -1		
		730 A -1	820 P -1	AR	Lincoln, NE	LV	920 A -1	1245 P -1		
		930 A -1	850 P -1	LV	Lincoln, NE	AR	735 A -1	1115 A -1		
		700 P -1	345 A -2	AR	Denver, CO	LV	800 P -0	1100 P -0		

Through service to and from West Coast via Denver-DRGW and connections.

APPENDIX D

Suggested proposed rules for the determination of what constitutes reasonable dispatch

(1) *Reasonable dispatch.*—The term "reasonable dispatch," when employed in connection with the transportation of nonperishable commodities, means the performance of transportation on the dates or within the time published by a carrier in its schedules, or during the period of time agreed upon by the carrier and the shipper and shown on the bill of lading; *Provided, however,* That the defenses of force majeure as construed by the courts shall not be denied the carrier.

(2) *Reasonable dispatch required.*—Each carrier subject to the Interstate Commerce Act will cause to be transported with reasonable dispatch each shipment of nonperishable commodities accepted by it for transportation.

(3) *Notification of delay in providing service.*

(a) *Notification of delay in initiating service.*—Whenever a carrier is unable to initiate a shipment of a nonperishable commodity or commodities on the dates or within the times published by the carrier in its schedules or during the period of time specified in the receipt or bill of lading, the carrier shall notify the shipper or his representative, by telephone, telegraph, or in person, at the carrier's expense, of the delay, the date or period of time during which initiation of the shipment will be made, and shall repeat such notification if any subsequent date or period of time so assigned is not met. Such notification shall be given as soon as it becomes apparent to the carrier that it is unable to initiate the transportation service in accordance with the terms originally understood by the parties. Notification as required herein shall not affect the determination of compliance by the carrier with reasonable dispatch as required in the next preceding paragraph.

(b) *Notification of delay in delivery.*—Whenever a carrier is unable to make delivery of a shipment of a nonperishable commodity or commodities on the dates or within the times published by the carrier in its schedules or during the period specified in the receipt or bill of lading, the carrier shall notify the shipper (or person designated by the shipper to receive such notice), by telephone, telegraph, or in person, at the carrier's expense, of the location and general condition of the shipment, the reason for such delay, and the date or period of time during which delivery of the shipment will be made. The carrier shall also repeat such notification if any subsequent date or period of time so assigned is not met. Such notification shall be given as soon as it becomes apparent to the carrier that it is unable to complete delivery of the shipment in accordance with the terms of the receipt or bill of lading, or its published schedules; *Provided,* That the requirement of this paragraph shall not apply where the carrier is unable to obtain from the shipper an address or telephone number for such notification. Notification as required herein shall not affect the determination of compliance by the carrier with reasonable dispatch as required in the second preceding paragraph.

(4) *False or misleading information prohibited.*—No carrier shall knowingly and willingly give false or misleading information as to the reason for delay in initiating or delivering a shipment of a nonperishable commodity or commodities.

(5) *Record of notification.*—When notification required by paragraphs (a) or (b) of section 3 is given, a record shall be prepared by the carrier setting forth the time and method of notification, the name of the person notified, the reason for delay, the location and general condition of the shipment involved in cases of delay in delivery,

the new date or period assigned for initiating service or making delivery, and the signature of the person who gave such notification. The carrier shall preserve the record thus made as a part of its record of the shipment or shipments involved.

APPENDIX E

Suggested operating rules for the determination of what constitutes reasonable railroad terminal operations

(1) Outbound loaded freight cars must be removed from the point of loading interchange tracks of industrial plants within 24 hours, exclusive of Sundays and holidays, following acceptance of carrier by the shipping instructions covering the movement of such cars into road service or to a connecting line when such connection is required by the billed route. An additional 24 hours, exclusive of Sundays and holidays, shall be allowed to a connecting line(s) to move such cars through the origin terminal for movement in road service pursuant to the billed route.

A total of not more than 48 hours, exclusive of Sundays and holidays, shall be allowed from acceptance by carrier of shipping instructions for moving such cars through the origin terminal into road service where two or more connecting carriers at such origin terminal are involved.

(2) Where loaded freight cars are delivered by one carrier to another carrier at an intermediate interchange point, such interchange must be accomplished within 24 hours after arrival of such cars at the interchange point. The receiving carrier at such interchange point must move such cars within 24 hours of receipt into road service or to another carrier at the interchange point; provided however, that not more than 48 hours shall be taken by all carriers at such interchange points from the time such cars arrive at the interchange point to subsequent movements in road service pursuant to the billed route.

(3) Where the billed route requires handling, of loaded freight cars at internal junction point(s) for transfer from one train to another of the the same carrier, such cars must be moved within 24 hours after arrival at such internal junction point into road service pursuant to the billed route.

(4) Inbound loaded freight cars must be moved from road service within 24 hours, exclusive of Sundays and holidays, in the destination terminal to the point of unloading or interchange tracks of the receiving industry or to a connecting line in the destination terminal. An additional 24 hours, exclusive of Sundays and holidays, shall be allowed to connecting line(s) to move such cars through the destination terminal for delivery to the receiving industry or for constructive placement. A total of not more than 48 hours, exclusive of Sundays and holidays, shall be allowed from arrival of such cars at a destination terminal to actual placement for unloading, or to constructive placement where two or more connecting carriers at such destination terminal are involved.

(5) The operating requirements contained in rule (1) through (4) above shall also apply to the handling and movement of empty freight cars of private ownership where such cars are tendered for movement in road service under bills of lading.

(6) Loaded freight cars and empty freight cars of private ownership must not be moved contrary to billed instructions.

(7)(a) Delays, if directly attributable to acts of God, civil commotion, riot, necessary repairs, other than urgent repairs, car cleaning, wrecks, washouts, strikes, lockouts, or acts or instructions of shipper or receiver, shall be deemed to be delays not within the power of the carrier to control, and shall allow a suspension of the requirements contained in rules (1) through (4) for a period of 24 hours, unless good cause can be shown why a longer suspension is justified.

(b) Where daily freight service has been discontinued by a carrier from any origin, terminal, interchange, or internal junction point, on the route pursuant to the billed instructions, the time limits specified in these operating rules shall begin to run as of 12:01 a.m. on the date of the next train operated by such carrier from such origin, terminal, interchange, or internal junction point, to or in the direction of the trains destination.

(8) Any controversy or claim arising out of or relating to these operating rules shall be settled by arbitration in accordance with the rules of the American Arbitration Association, or its successor; and any judgment of such arbitration shall be final. Any judgment upon an award rendered pursuant to such arbitration may be entered in any court having jurisdiction thereof.

(9)(a) The provisions of these rules shall apply to intrastate, interstate, and foreign commerce.

(b) Holidays shall be those listed in Item 25 Series of Agent Maurer's Tariff 4-I, I.C.C. H-36, and supplements thereto or successive issues thereof.

(10)(a) The provisions of any service order(s) issued by the Commission shall control and govern in the event of a conflict between the operating rules contained herein and the provisions of any such service order(s).

(b) The operation of all rules and regulations, except as provided in rule (11)(a) above, that conflict with the operating rules hereof is hereby suspended.

(11) Carriers subject hereto and claimants hereunder shall make quarterly reports to the Commission supplying such information respecting the administration hereof as may be required by the Commission.

APPENDIX F

Procedures to be followed as a minimum in the test of service rendered by railroads in their major terminals

A. GENERAL

1. The test period shall run for a period of 40 consecutive days.
2. The terminal investigators shall be representatives of the railroads which are involved with interchange service at the selected terminals.
3. The investigators are to record the information required below as to all cars interchanged at the selected terminals.
4. The test results are to be compiled on a weekly basis.

B. DATA TO BE GATHERED

The investigators shall record the following information regarding all cars interchanged at the selected terminal during the test period.

1. Identification of car by letters and number.
2. Type of car, separating ice bunker refrigerator cars; piggyback cars and plain, counting each trailer as a separate car; and other cars.
3. Whether car loaded or empty.
4. Ultimate destination of car.

5. Number of train and time of arrival at the selected terminal, showing the time by which actual arrival time varied from scheduled time.

6. As to all cars intended to move through the terminal, number of train and time of departure from the terminal, showing whether this train made its intended connection, and, if not, why it missed such connection; also showing the time by which actual departure varied from scheduled time of departure; also showing whether there was another train or trains leaving the terminal after the car's arrival and before its departure, the number, scheduled departure time, and actual departure time of any such train, and why the car did not leave on such train.

The investigators shall also record the number of (1) cars delivered to the terminal for interchange, and (2) total cars on each train leaving the terminal, in each case identifying each train.

APPENDIX G

Form BOp-105 summary—all regions

Period covered: November 5, 1971, to September 15, 1972

Mechanically defective car	138
Transit delay	118
Car not clean	76
Car shortage	38
Placing delay	32
Terminal delay	21
Mishandling/misrouting	15
Switching delay	13
Pulling delay	10
Weighing	6
Billing error	4
Bunching	2
No service	1
	474

Ten or more service deficiency reports

Norfolk and Western	90
Chicago and North Western	53
Louisville and Nashville	48
Southern	45
Lehigh and New England	43
Penn Central	42
Southern Pacific	32
Illinois Central	26
Burlington Northern	18
Union Pacific	11
Missouri Pacific	11
	419

APPENDIX H

Table of contents

- I Background 1224
- II Evidence 1226
  - Record in prior proceedings 1226
  - Form BOp 105 reports 1226
  - Respondents' periodic reports 1228
  - Additional representations 1229
  - Statements in reply 1230
- III Discussion and Conclusions 1234
  - Jurisdiction 1234
  - Objectives of this proceeding 1242
  - The meaning of adequate freight service 1243
  - Adequacy of present service 1244
  - Measures available for improving service 1248
  - Service schedules 1259
  - Empty car movements 1262
  - Reasonable dispatch 1263
  - Terminal operations 1266
  - Freight car adequacy 1271
  - Track maintenance and rehabilitation 1278
  - Demurrage and freetime allowances 1282
  - Alternate rate structure 1286
  - Reciprocal demurrage 1290
  - Earmarking percentages of revenue 1294
  - Shipper-carrier conferences 1295
  - Railroad electrification 1296
  - Utilization of "short trains" 1299
  - Labor-management relations 1302
  - Other factors affecting service 1306
- IV Summation 1308
- V Findings 1309
- VI Appendixes 1311
  - A - Part I - Identities of the parties 1311
    - Part II - Positions of the parties 1312
  - B - Digest of respondents' periodic reports 1346
  - C - Suggested rules and regulations pertaining to the establishment of service schedules and examples of existing service schedules 1349
  - D - Suggested proposed rules for the determination of what constitutes reasonable dispatch 1359
  - E - Suggested operating rules for the determination of what constitutes reasonable railroad terminal operations 1360
  - F - Procedures to be followed as a minimum in the test of service rendered by railroads in their major terminals 1361
  - G - Form BOp-105 summary—all regions 1362
  - H - Table of contents 1363

Ex Parte No. 270 (Sub-No. 1B)

INVESTIGATION OF RAILROAD FREIGHT RATE STRUCTURE—EXPORT-IMPORT RATES AND CHARGES—GREAT LAKES

Decided June 1, 1976

Upon investigation into the export-import rates and/or changes to and from the Great Lakes ports and other recognized groups of ports, found:

1. That the requested prescription of shipside rates for application on grain products exported through the Great Lakes ports subject to a 12-cent per 100-pound waterborne charge should be denied.
2. That the requested equalization of rates at west bank Lake Michigan ports on export-import traffic moving to and from a described portion of western trunkline territory should be denied.
3. That the rail rates applicable on general commodities, grain products, TOFC/COFC, and FAK export-import traffic moving to and from the Great Lakes ports are not shown to be unjust and unreasonable in violation of section 1 of the act.
4. That the restrictions contained in various tariffs published by or for the accounts of the eastern railroad respondents which prohibit the application of domestic rates on export-import traffic moving to and from the eastern Great Lakes ports are not shown to be unjust and unreasonable.
5. That the rail rates applicable on all export-import traffic moving to and from the Great Lakes ports are not shown to be unjustly discriminatory in violation of section 2 of the act.
6. That the rail rates applicable on all general commodities, grain products, TOFC/COFC, and FAK export-import traffic moving to and from the Great Lakes ports are not shown to be unduly prejudicial or preferential in violation of section 3(1) of the act.
7. That the requested prescription of the Great Lakes petitioners' formula for removal of undue prejudice and preference is not warranted by the evidence of record, and it is hereby denied.
8. That the rail rates applicable on whole grains, corn, and soybeans moving in export commerce to the Great Lakes ports are not shown to be unjust and unreasonable, but are, in part, unduly prejudicial to the port of Chicago and unduly preferential of the gulf ports.
9. Order entered requiring respondent railroads to remove the undue preference or prejudice found to exist herein.

Edwin F. Avery, Robert W. Barclay, Peter J. Burns, John M. Cleary, John J. Desmond, Norman A. Fox, Leonard J. Goodsell, James F. Hickcox, Richard L. Huff, John F. Hynes, Gayle Johnson, Robert K. Jorgensen, Charles F. Deeley, R. J. Laubenstein, John A. McWilliam, Frank E. Polom, Richard L. Schultz, George B. Schwahn, J. A. Seefeldt, Harry G. Slater, Robert H. Smith, Harold E. Spencer, Arthur W. Todd, and *Frederic L. Wood* for petitioners.

Mark Goldstein, Harold C. Heublein, Joseph A. Illes, George C. Kiba, Robert Mackey, Bernard Rane, and *Byron D. Rasmussen* for interveners in support of petitioners.

Henry N. Babcock, H. B. Barnes, Martin L. Cassell, William F. Cottrell, Robert S. Davis, John H. Doeringer, J. D. Feeney, Stuart F. Gassner, James L. Howe III, Daniel J. Humphrey, Rodger K. Johnson, Edward A. Kaier, Howard D. Koontz, Charles N. Marshall, Don McDevitt, Richard A. Mehley, Richard J. Murphy, Joseph J. Nagle, C. Harold Peterson, Frederick G. Pfrommer, Thomas H. Ploss, Howard E. Roos, John F. Smith, Donald M. Tolmie, Donal L. Turkal, and *Alan M. White* for railroad respondents.

M. A. Barrilleaux, Douglas W. Binns, J. Robert Bray, Henry M. Breadnax, Laurence F. Daspit, Paul M. Donovan, C. D. Haig, Jr., Hudson B. Hamilton, Martin A. Hechscler, Arthur W. Jacocks, Sam H. Lloyd, Charles H. Lombard, Samuel H. Moerman, George F. Mehr, Marion S. Moore, Jr., Carl S. Parker, Jr., L. A. Parrish, Louis A. Schwartz, George E. Strange, and *Arthur L. Winn, Jr.,* for interveners in support of respondents.

Milton P. Barschdorf, Oliver Callson, William E. Carpenter, Kenneth G. Crowl, Herschel Cutler, Chester H. Gourley, Jon C. Hansen, Salley Katzen, Philip G. Kraemer, Robert D. Kraft, Raymond B. Nugent, Albert E. Parker, G. B. Perry, and *G. K. Winn* for other interested parties.

John E. Gillick and *Carolyn Cox Stitt* for U.S. Department of Transportation.

Bernard A. Gould and *James R. Taylor* for Bureau of Enforcement, Interstate Commerce Commission.

REPORT AND ORDER OF THE COMMISSION

BY THE COMMISSION:

Exceptions to the initial decision of the Administrative Law Judge were filed by various petitioners, interveners in support of petitioners, eastern railroad respondents, and the Bureau of

Enforcement. Subsequently, several groups of railroad respondents, an intervener in support of respondents, and two petitioners replied. Exceptions and requested findings not specifically discussed in this report nor reflected in our findings or conclusions have been considered and found not justified or not necessary for the proper disposition of this proceeding.

BACKGROUND OF THE PROCEEDING

By order dated December 11, 1970, the Commission instituted Ex Parte No. 270, Investigation of Railroad Freight Rate Structure, under the authority of section 13(2) of the Interstate Commerce Act. In response to that order various port interests complained that the export-import rates to and from their ports had become distorted in relation to corresponding rates to and from other ports, and that outstanding Commission orders were thereby ignored.

Based on the allegations of the Great Lakes and Pacific coast port interests that there was reason to believe certain export-import rates and charges to and from these ports may be unjust and unreasonable, unjustly discriminatory, or unduly prejudicial and preferential in violation of sections 1, 2, or 3 of the act, the Commission, by order dated April 19, 1971, on its own motion, instituted an investigation in Ex Parte No. 270 (Sub-No. 1), Investigation of Railroad Freight Rate Structure—Export-Import Rates and Charges, concerning the export-import rates and/or charges to and from (1) the Pacific coast ports, on the one hand, and, on the other, other recognized group of ports, and (2) the Great Lakes ports, on the one hand, and, on the other, other recognized groups of ports. All common carriers by railroad subject to the jurisdiction of the Commission were made respondents in the proceeding.

Following a prehearing conference held at Chicago, Ill., on June 30, 1971, an order dated August 10, 1971, was entered designating all parties seeking affirmative relief in this proceeding "petitioners," and directing them to file verified statements containing the evidence upon which they relied to establish a prima facie case for the relief sought.

By order dated March 31, 1972, the Commission granted petitions of certain Pacific coast and Great Lakes port interests seeking separation of the issues concerning the Pacific coast ports from those of concern to the Great Lakes ports. The order noted that while the Great Lakes ports were concerned primarily with the rate *structure* to and from those ports in relation to the corresponding rate structures to and from other ports, in contrast, the Pacific coast ports contended that authorized percentage increases in export-import rates had widened the spread in their rates over those to and from competitive ports, distorting previous relationships. Thus, the issues of concern to the Pacific coast ports were separated and considered in Ex Parte No. 270 (Sub-No. 1A), *Investigation of Railroad Frt. Rate Structure*, 345 I.C.C. 423 (1975), and the issues concerning the Great Lakes ports were separated for determination in this proceeding. The Commission's Bureau of Enforcement was directed to participate in each proceeding for the purpose of developing the records.

This proceeding was referred to an Administrative Law Judge for hearings which were held at Chicago, Ill., following the submittal of verified statements by petitioners, respondents, and interveners. Subsequently, briefs were filed by the parties and the Bureau of Enforcement. An initial decision and recommended order was served on November 26, 1973.

THE PARTIES AND THEIR CONTENTIONS

In this proceeding, statements were submitted on behalf of the following interests: the Lake Erie ports of Cleveland, Detroit, and Toledo; the Lake Michigan ports of Chicago, Green Bay, Kenosha, and Milwaukee; and the Lake Superior ports of Duluth and Superior. These interests and others were represented by the following petitioners: Board of Trade of the City of Chicago; Brown County Harbor Commissioners for the Port of Green Bay; Burrus Milling Department of Cargill, Inc.; city of Milwaukee; Cleveland-Cuyahoga County Port Authority; Detroit Marine Terminals, Inc.; Great Lakes Ports Traffic Committee; Great Lakes Task Force; International Association of Great Lakes Ports; Seaway Port Authority of Duluth; Toledo-Lucus County Port Authority; State of Illinois; Department of Business and Economic Development; State of Wisconsin; and Western Great Lakes Port Association. In addition, the Indiana Port Commission intervened in behalf of the Port of Indiana-Burns Waterway Harbor, but did not present any evidence.

As designated in the order instituting this proceeding, the respondents are all the railroads operating in the United States. However, the respondents herein were principally represented by three groups which will be referred to as (1) the eastern railroads who serve the North Atlantic ports and the Great Lakes ports, Chicago and east, (2) the Southern Ports Foreign Freight Committee (SPFFC), consisting of railroads which serve the gulf and South Atlantic ports, on the one hand, and, on the other, interior points on and west of the Chicago, Indianapolis, Cincinnati line, north of the Ohio River, and west to and including parts of Colorado and Idaho; and (3) the Western Trunk Line Committee (WTL) railroads which serve the Great Lakes ports of Chicago, Duluth, Green Bay, Kenosha, Milwaukee, and Superior.

Interveners supporting the respondent railroads were: Delaware River Port Authority; Georgia Ports Authority; Gulf Ports Association, Inc.; Houston Port Authority; New Orleans Traffic and Transportation Bureau; Port Authority of New York and New Jersey; South Carolina State Ports Authority, and Virginia Port Authority. The Bureau of Enforcement, Interstate Commerce Commission also presented evidence and actively participated in the proceeding.

Initially, the petitioners took various positions which were related only in that each port sought the establishment of export-import rates[1] to and from interior points (generally referred to as the particular port's hinterland area) based upon the percentage of the first-class or class 100 rates prescribed in docket No. 28300, *Class Rate Investigation, 1939*, 262 I.C.C. 447 (1945), and later reports, which it found applicable on a particular commodity from the same interior point to another North Atlantic, South Atlantic, or gulf port (hereinafter collectively called the tidewater ports). At the hearing a joint statement of proposed relief desired by most petitioners was presented. In essence, this statement provided that rates to and from the Great Lakes ports should not exceed the percentage of docket No. 28300 first-class rates reflected by the rates applicable on the same commodity or traffic between the same interior point and the lowest rated tidewater port. Subsequently, this statement of proposed relief was abandoned by the petitioners and a new statement of position was presented which is reproduced in appendix A hereto.

In their revised request for relief petitioners seek a finding that the present rates applying on export-import traffic moving through the Great Lakes ports are unreasonable and unduly prejudicial to petitioners and preferential of the tidewater ports. They advocate the establishment of export-import rates applicable on general commodities (except whole grains), trailer-on-flatcar/container-on-flatcar (TOFC/COFC), and freight all kinds (FAK) traffic moving between interior points and the Great Lakes ports, based upon the use of three key ports: Baltimore, Md., in the North Atlantic range; Charleston, S.C., in the South Atlantic range; and New Orleans, La., in the gulf range. Export-import rates to and from the Great Lakes ports are not to exceed the same percentage of the docket No. 28300 first-class rates reflected by the export-import rates between the same interior point and one of the key tidewater ports. Where such rates apply between an inland point and only one tidewater range, the key port of that range would be used as the basis for determining the rates to and from the Great Lakes ports. If rates are published between an inland point and more than one tidewater range, then either the key port of Baltimore or New Orleans would be used, depending upon the interior area involved. Thus, Baltimore would be used as the key port for determining Great Lakes ports' rates to and from points located in trunkline (TL), trunkline arbitrary (TLA), and Central Freight Association (CFA) territories, while New Orleans would be the key port for properly related Great Lakes ports rates to and from points located in Illinois Freight Association (IFA), Southwestern Freight Bureau (SWFB), Southern Freight Association (SFA), and Western Trunk Line Committee territories. Although Charleston is not considered an important competitive port, petitioners assert that it was included in order to have a complete formula in the event that the South Atlantic ports may be the only tidewater range to and from which a particular rate is published.

---

[1] All rates, costs, and differences therein will be stated in cents per 100 pounds at the Ex Parte No. 267-B level, except where otherwise indicated.

Petitioners also state that export-import rates to the Great Lakes ports (determined in the manner described above) should be established on request of any interested party where an export-import rate is published and applicable on any commodity or traffic moving between an interior point and a tidewater port. In addition, it is urged that such export-import rates to and from the Great Lakes ports should be subject to the same minimum weights, transit privileges, free-time provisions, and demurrage charges applying between the interior points and the tidewater ports. Moreover, petitioners request that all future general rate increases be applied uniformly on all export-import traffic moving through the various port ranges, regardless of whether the applicable rates are designated export-import.

Some of the petitioners, particularly the State of Michigan, aver that domestic rates constitute the best available standard for application on export-import traffic moving to and from the eastern Great Lakes ports (all ports east of Chicago). It is, therefore, requested that all restrictions contained in respondents' tariffs which prohibit the application of domestic rates on export-import traffic moving through the eastern Great Lakes ports be found unreasonable. Thus, it is suggested that the domestic rates should apply as maxima and such tariff restrictions should be ordered removed.

In addition to the foregoing general position, several parties seek different forms of relief specifically tailored to their traffic or competitive situations. The Chicago Board of Trade and several other petitioners contend that a just, reasonable, and nonprejudicial rate structure on whole grains, including soybeans, moving from indicated origins to Chicago and other Great Lakes ports should not exceed a certain percentage of the docket No. 28300 first-class rates. Thus, they seek the prescription of specific percentage formulae on whole grain and soybean traffic.

The port of Green Bay, Wis., subscribes to the general position of petitioners. However, this petitioner contends that Green Bay can survive as a viable port only if railroad rates are equalized on export-import traffic moving between the west bank Lake Michigan ports of Chicago, Green Bay, Kenosha, and Milwaukee, on the one hand, and, on the other, interior points in WTL territory west of the Mississippi River and the Minnesota-Wisconsin State line, including the State of Montana. Green Bay, therefore, requests the prescription of equalized rates at all west bank Lake Michigan ports.

Finally, the Burrus Milling Department of Cargill, Inc., also appeared as a petitioner in this proceeding. This petitioner did not subscribe to the general request for relief previously described. Instead, petitioner alleges that shipside rates,[2] subject to a waterborne charge are applicable to its grain products shipped through the gulf ports. Since its competitors ship grain products through Great Lakes ports on line-haul rates, which differ from shipside rates and do not include a waterborne charge, petitioner maintains those ports have a rate advantage in the export shipment of grain products. It requests that this rate advantage be eliminated by the prescription of shipside rates subject to a waterborne charge for application on grain products exported through the Great Lakes ports.

Shipside rates apply on shipments picked up or delivered alongside a vessel.

The respondent railroads and interveners in support of respondents state that existing rail rates on export-import traffic moving to and from the Great Lakes ports are in most cases lower in actual amount than compared rates to and from the tidewater ports and allow the Great Lakes ports to compete effectively for foreign commerce. Respondents contend they have responded in the past to justifiable requests for reduced rates on export-import traffic and will continue to do so in the future. Furthermore, respondents fear that adoption of the proposed formula would place export-import rates strictly on a mileage basis which would be improper because of varying competitive factors affecting such rates. In addition, they state that the proposed formula would disrupt the present rate structure at the tidewater ports causing wholesale adjustments in those rates to reflect uniform percentage relationships of rates calculated under the formula.

The eastern railroad respondents, replying to the contentions of the eastern Great Lakes ports, generally urge that their tariff restrictions prohibiting the application of domestic rates on export-import traffic moving through these ports are justified by the different transportation conditions attendant to domestic and foreign commerce. Thus, they maintain that the tariff restrictions are not shown to be unreasonable and this request for relief should be denied.

In reply to petitioners' contentions respecting the rate levels on whole grains and soybeans, respondents assert that the present rate levels are just and reasonable and not unduly prejudicial or preferential. With regard to the port of Green Bay's request for equalization of export-import rates to and from the west bank Lake Michigan ports, respondents urge that no probative evidence was presented to support this request by petitioner and it should be denied. In addition, respondents and several Great Lakes petitioners assert that the railroads do not offer and are unable to furnish shipside service on export grain products at the Great Lakes ports. Therefore, it is contended that the requested prescription of shipside rates subject to a waterborne charge at these ports would be unreasonable and should be denied.

For convenience, appendix B hereto contains the Administrative Law Judge's summary of the evidence presented in this proceeding. The facts and arguments are set forth accurately and in detail therein. Accordingly, they will be restated only insofar as is necessary for a clear understanding of the issues.

THE INITIAL DECISION

In his initial decision the Administrative Law Judge concluded that the requested prescription of shipside rates subject to a 12-cent per-100-pound waterborne charge on grain products exported through the Great Lakes ports should be denied. This conclusion was predicated upon the fact that railroads serving the Great Lakes ports do not offer and cannot physically provide shipside services. In addition, the Great Lakes terminal operators collect transfer charges on agricultural commodities for providing the services this petitioner refers to under authority of tariffs on file with the Federal Maritime Administration. Thus, the evidence did not warrant the prescription requested by this petitioner.

The Administrative Law Judge also found that Green Bay's request for equalization of rates at west bank Lake Michigan ports on export-import traffic moving to and from a described portion of WTL territory should be denied. He concluded that petitioner failed to support its request for equalization with any evidence of rail cost of service, the commodities which would move under such a rate structure, any probative rate comparisons, the rates to be observed as minima, or a method for determining the new rate structure. Furthermore, it was found that because of the large area embraced within WTL territory there would be wide variances in the distances from interior points to the different west bank ports. Yet petitioner offered no suggestions for dealing with these variations in distance or other problems of equalization.

With regard to the contention that the rail rates applicable on general commodities, grain products, TOFC/COFC, and FAK export-import traffic moving to and from the Great Lakes ports are unreasonable, it was noted that petitioners relied upon the disparity in the percentage of docket No. 28300 first-class rates on this traffic moving between interior points and the Great Lakes and corresponding rates to tidewater ports in order to establish a violation of section 1 of the act. However, the Administrative Law Judge stated that the reasonableness of a rate is dependent upon a consideration of many factors. Instead of addressing these factors petitioners merely relied upon a showing that these rate differences were not related to different distances between interior points and the various ports. Moreover, he concluded that these rate comparisons could be given little probative weight, since petitioners did not show that the compared rates were moving traffic, that the commodities presented were representative of export-import traffic, or whether the compared rates were depressed to meet competition. He, therefore, concluded that the rates on these commodities were not shown to be unjust and unreasonable.

An issue related to the foregoing one is the attack upon the eastern railroad respondents' tariff restrictions prohibiting the application of domestic rates on export-import traffic moving through the eastern Great Lakes ports. Petitioners urge that these tariff restrictions are unjust and unreasonable, and should be removed by prescribing the domestic rates as maxima on export-import traffic moving through the eastern Great Lakes ports. Respondents contend that differences in carrier competition for domestic and export-import traffic moving to the eastern Great Lakes ports justify the different rate levels at issue and that removal of the considered restrictions would result in unwarranted, drastic reductions in carrier revenues. The Administrative Law Judge concluded that the respondents' only rationale for these tariff restrictions was a fear that they would suffer a reduction of revenue by the application of domestic rates to this traffic. Thus, he found that these restrictions were unreasonable and ordered them canceled.

As noted previously, petitioners also alleged that the rates at issue herein violate section 2 of the act. This allegation of unjust discrimination was subsequently abandoned since no evidence was offered to support it.

The principal issue presented in this proceeding is whether the petitioners allegations of undue prejudice to the Great Lakes ports and preference to the tidewater ports have been established on the record. Petitioners rely upon their showing that the rates on various commodities moving between interior points and the Great Lakes ports reflect a generally higher level or percentage, distance considered, of the docket No. 28300 first-class rates than do the rates to tidewater ports. In addition, they urge that the existence of competition between port ranges leads to a presumption of competitive injury stemming from these rate disparities; that respondents are the common source of this undue prejudice; and that respondents have not established the existence of different transportation conditions which would justify the disparate treatment said to exist. After considering the evidence on this issue, the Administrative Law Judge found that the rail rates applicable on general commodities (except whole grains and soybeans), TOFC/COFC, and FAK traffic moving in foreign commerce were not shown to be unduly prejudicial to the Great Lakes ports or preferential of the tidewater ports in violation of section 3(1) of the act.

Finally, the port of Chicago and several other petitioners seek a finding that the present rail rates on export-import shipments of whole grains and soybeans are unreasonable and unduly prejudicial of petitioners and preferential to the tidewater ports. They request prescription of just, reasonable, and nonprejudicial grain rates at certain maximum percentage of the docket No. 28300 first-class rates. The Administrative Law Judge found that the present rail rates on export shipments of whole grains and soybeans were not shown to be unreasonable or unduly prejudicial to the Great Lakes ports or preferential to the tidewater ports in violation of the act.

Exceptions and Replies

Preliminarily, several petitioners filed motions for oral argument in conjunction with their exceptions or replies, two of which allege that this proceeding is one of general transportation importance. While we are cognizant of the importance of this proceeding to the parties, it is not clear that any advantage would be gained by delay of this investigation pending oral argument. Since this proceeding has already been the subject of extended hearings and a lengthy initial decision further delay would unduly prolong the administrative process. Moreover, petitioners' allegations that this is a matter of general transportation importance are of no significance as the proceeding is now pending before the entire Commission. The requests for oral argument are, therefore, denied.

On exceptions, Wisconsin states the recommended findings, that the rail rates applicable on general commodities, whole grains and soybeans, and TOFC/COFC traffic moving in export-import commerce to and from the Great Lakes ports were not shown to be unjust and unreasonable or unduly prejudicial and preferential, are clearly erroneous. It supports this statement by reference to the fact that Wisconsin ports handled a smaller percentage share of exported manufactured goods than the State alone produced during 1969.[1] In addition, petitioner reiterates that the evidence shows the rates applicable on six commodities moving to or from Wisconsin ports bear a higher percentage relationship to the docket No. 28300 first-class rates, than corresponding rates to or from various tidewater ports. This evidence is summarized below:

---

[1] Petitioner's exhibit B-38 shows that during 1969 manufactured export originating in Wisconsin were valued at $785.3 million, while the comparable figure for the whole U.S. was $29.2 billion. Thus, Wisconsin produced 2.7 percent of U.S. manufactured exports, while its ports handled only 1.4 percent of the Nation's total export tonnage.

TABLE I

Commodity and or destination	Wisconsin		Competing ports	
	Port	Percent of class 100	Port	Percent of class 100
Agricultural implements from:				
Cedar Rapids, Iowa	Milwaukee	26.4	Corpus Christi, Tex	18.6
East Moline, Ill	----do	27.0	Houston, Tex	13.7
Rockford, Ill	Kenosha	27.5	Norfolk, Va	20.2
Des Moines, Iowa	Green Bay	26.5	New Orleans, La	18.7
Ottumwa, Iowa	Superior	26.5	Mobile, Ala	20.1
Aluminum sheet from:				
Davenport, Iowa	Milwaukee	44.9	Corpus Christi, Tex	17.8
Bentonite clay from:				
Belle Fourche, S. Dak	Superior	18.2	Pensacola, Fla	11.1
Cattle hides from:				
St. Joseph, Mo	----do	25.6	New Orleans, La	21.0
Conveyor belts from:				
Cedar Rapids, Iowa	Milwaukee	40.1	Corpus Christi, Tex	35.1
Crude rubber to:				
Des Moines, Iowa	Superior	18.2	New Orleans, La	10.6
Eau Claire, Wis	----do	23.9	Corpus Christi, Tex	14.8

Furthermore, petitioner points out that while the Wisconsin ports almost always have lower rates, in absolute terms, they suffer a rate disability on this traffic which is calculated as the difference between the rate actually applicable and the rate which would be applied if the competing tidewater ports' percentage of the docket No. 28300 first-class rates were also in effect to the Wisconsin ports. Finally, petitioner presented the following table which allegedly demonstrates that the line-haul rate disabilities suffered by Wisconsin ports on export wheat flour shipments are compounded when combined with unabsorbed port charges and expressed as total export charges.

TABLE 2

Wisconsin port	Class 100 rate	Export charges total	Total export charges as percent of class 100
		Cents per hundredweight	
Green Bay	581	85.0	14.6
Kenosha	532	84.0	15.8
Milwaukee	532	86.5	16.3
Superior	561	99.5	17.7
Competing port			
Pensacola, Fla	678	80.15	11.8
Mobile, Ala	657	76.9	11.7
New Orleans, La	638	78.75	12.3
Houston, Tex	553	83.25	15.1
Corpus Christi, Tex	619	83.25	15.1

Based on the foregoing evidence, petitioner submits that the rates applicable on these commodities when moving through Wisconsin ports bear a substantially higher relationship to first-class rates than comparable rates to competing tidewater ports and, therefore, the rates to Wisconsin ports are unjust and unreasonble.

Petitioner alleges that this evidence also establishes that the considered rates are unduly prejudicial to the Great Lakes ports and preferential of the tidewater ports. It supports this argument by noting that a section 3(1) violation can be found even where the rates complained of are lower in absolute amount than the compared rates and that recent Commission decisions have found the docket No. 28300 first-class rates are a proper basis for testing and prescribing the lawful relations of rates. See *Cudahy Packing Co.* v. *Akron, C. & Y. R. Co.*, 318 I.C.C. 229, at 245 (1962), affirmed *sub nom. Atchison, Topeka & Santa Fe Railway Co.* v. *United States*, 218 F. Supp. 359 (1963); and *Chicago Board of Trade* v. *Illinois Central R. Co.*, 344 I.C.C. 818 (1973), affirmed *sub nom., Chicago & Eastern Illinois R. Co.* v. *United States*, 384 F. Supp. 298 (1974), affirmed 421 U.S. 956 (1975). It is also asserted that the Administrative Law Judge erroneously placed the burden on petitioners of showing that this demonstrated rate disparity was not justified by transportation conditions. Thus, it is urged that petitioners have sustained their burden of proof under section 3(1) of the act; that comparisons of the considered rates with the docket No. 28300 first-class rates are a proper means of showing the disparities in carriers' rate levels on export-import traffic; that respondents have not justified the disparities by establishing the existence of different transportation conditions attendant to the different rate levels; and that this Commission should exercise its powers under section 15(1) of the act to establish just and reasonable rates on export-import traffic moving to and from the Great Lakes ports.

The Seaway Port Authority of Duluth excepts to the finding that rail rates applicable on general commodities moving in export-import commerce to and from the Great Lakes ports are not shown to be unjust and unreasonable or unduly preferential and prejudicial in violation of sections 1 and 3(1) of the act, respectively. However, petitioner states that the initial decision correctly defined and outlined the issues in this proceeding, and accurately summarized the evidence presented.

This petitioner contends that the evidence presented containing comparisons of export-import rates on various commodities to the Great Lakes ports with rates on the same commodities to tidewater ports and the relationship of each to docket No. 28300 first-class rates clearly indicates the unreasonableness of the present export-import rate structure at the Great Lakes ports. It cites *Sterling Colo. Beef Co.* v. *Atchison, T. & S. F. Ry. Co.*, 339 I.C.C. 530 at 536 (1971), in support of the proposition that a rate may be unreasonable in relation to another, or relatively unreasonable, as a result of comparing the two, and maintains that such a comparison establishes that the rates at issue are unjust and unreasonable.

With regard to the issue of undue prejudice and preference in the export-import rates at the Great Lakes ports, petitioner states that the initial decision relied upon *William Volker & Co. of Texas* v. *Atchison, T. & S.F. Ry.*, 318 I.C.C. 249 (1962), and *Meat and PHP, TOFC, SWL, WTL, Official Territories*, 340 I.C.C. 214 (1970), and 344 I.C.C. 299 (1973), for the respective postulates that (a) the docket No. 28300 domestic class rates were not prescribed for application on export traffic, and (b) the Commission has never taken the position that rail rates and charges must be exactly related to distance in order to avoid preference and prejudice. However, it urges that *Volker, supra,* is not applicable since the petitioners do not seek the application of domestic rates on export-import traffic (cf. the position of Michigan and several other petitioners), but merely to use the domestic rates as a measure of the relationships between rates to and from different ports. Additionally, the Commission assertedly observed in *Chicago Board of Trade, supra,* at 832, that *Volker, supra,* was no precedent for rejecting use of the domestic class rate scale to measure differences in rates and to prescribe just and reasonable rates for the future. Furthermore, the *Meat* case, *supra,* is distinguishable on its facts and assertedly did not overrule the decision in *Cudahy, supra.* Thus, petitioner contends that the docket No. 28300 first-class rates are a proper yardstick with which to establish a disparity in rates under section 3(1) of the act.

Petitioner further contests the conclusion that mere differences in rates do not establish a violation of section 3(1) unless it is shown that the differences adversely affect the opportunity to compete. According to Duluth, this is another way of saying that injury must be proven to stem from these rate differences. However, the petitioner avers it is not required that specific injury be shown to establish undue prejudice, or that the allegedly prejudicial rates be higher than the preferred in actual amount, and that the other factors (such as ocean freight rates) which may account for a shipper's choice of ports are not relevant in determining the lawfulness of the level or relationships of railroad rates to various port ranges. In summary, petitioner urges it has established a prima facie case of undue prejudice and preference and that other factors, such as ocean or terminal charges and railroad costs of service could only be relevant if offered by the respondents to show that the prejudice existing in the rate structure to the Great Lakes ports is not undue, i.e., that disparate rates are justified by different transportation conditions.

Finally, petitioner insists that the present rate structure denies it the natural advantage of geographic proximity to its hinterland. Therefore, it is contended that the petitioners' proposed formula for relief should be prescribed in order properly to relate export-import rates to the various port ranges and to allow each port an opportunity to compete for the Nation's foreign commerce.

The International Association of Great Lakes Ports also filed exceptions to the initial decision, which are fully supported and adopted by the Great Lakes Task Force. These exceptions are substantially the same as those filed by the city of Milwaukee. Basically, these petitioners object to the recommended findings on the major issues presented for the same reasons enunciated by other petitioners. Therefore, there is no need to repeat them.

However, these petitioners also state that comparative rail car-mile earnings submitted in evidence were disregarded in the initial decision, despite the fact that they allegedly show the present rates on export-import traffic moving to the Great Lakes ports are unreasonable. It appears that these petitioners are specifically referring to evidence submitted by the ports of Cleveland and Green Bay, although Duluth, Toledo, and Milwaukee presented similar comparisons.[4]

The evidence of Green Bay contains the mileage, present rates, minimum weights, first-class rates, and percentages of first-class, as well as the car-mile earnings on movements of four commodities from three interior points to Green Bay and New Orleans. The commodities and origins considered were: agricultural implements from Cedar Rapids, Iowa; aluminum sheet from Davenport, Iowa; and cattle hides and soybean oil from St. Joseph, Mo. This exhibit[5] shows that agricultural implements move from Cedar Rapids to New Orleans, a distance of 972 miles, at a rate of 155 cents, 80,000 pounds minimum, and produce car-mile earnings of 128 cents. In contrast, the same commodity assertedly moves from the same origin to Green Bay, a distance of 327 miles, at 99 cents, minimum 50,000 pounds, for car-mile earnings of 151 cents. Similarly, aluminum sheet moves from Davenport to New Orleans, a distance of 910 miles, at 150 cents, 30,000 pounds minimum, while from the same origin to Green Bay, a distance of 281 miles, a rate of 91 cents applies for a 30,000-pound minimum weight shipment. These rates produce car-mile earnings of 41 cents and 97 cents to New Orleans and Green Bay, respectively. The remainder of this exhibit is similar in nature and will not be described further.

---

[4] The evidence presented by Cleveland and Toledo is directed to a different issue, which will be discussed elsewhere in this report.

[5] The exhibits described and illustrative tables contained in this report are based on rates and comparisons taken from the evidence. However, examples have been corrected where neccessary and reflect rates at the Ex Parte No. 267-B level.

The exhibits presented by Cleveland contain similar information on movements of six commodities from seven interior points to Baltimore and Cleveland. See table 6, *infra*, for these comparisons. Duluth's exhibits include car-mile earnings on 15 commodities moving between nine interior points and Duluth, as well as Baltimore, New Orleans, and Norfolk. Some of this evidence is depicted in table 10. Toledo shows similar figures for 16 commodities moving between approximately 20 interior points and Baltimore, New York, Norfolk, and Toledo. These comparisons are illustrated in table 5. Finally, Milwaukee's exhibits show such comparisons on movements of 11 commodities plus FAK traffic from some 19 interior points to New Orleans and Milwaukee. Each of these exhibits indicates that car-mile earnings are lower in most instances to the more distant points.

These comparisons might seem to establish that the present rates on export-import traffic moving through the Great Lakes ports are unreasonable. However, closer analysis disproves this assumption. For instance, many of these comparisons are based upon rates at different minimum weights, which detracts from their probative value. Compare *Phelps Dodge Corp.* v. *Director General*, 57 I.C.C. 714, 717 (1920). Similarly, very large differences in mileage between interior points, on the one hand, and on the other, the Great Lakes and tidewater ports also limits the value of these comparisons. See *Eastern Livestock Cases of 1926*, 165 I.C.C. 277, 287 (1930). In addition, it is axiomatic that car-mile earnings are a function of both the rate level and the mileage involved. Thus, car-mile earnings usually will be lower for a longer than for a shorter movement. See *Magnesite from Pacific Coast to the East*, 286 I.C.C. 331, 335 (1952); *Columbia Metals Corp.* v. *Alton & S. R.*, 278 I.C.C. 761, 765 (1950); *Soap from Jersey City to Norfolk*, 253 I.C.C. 231, 235 (1942); and *Lake Cargo Coal from Ill., Ind., and Ky. to Chicago*, 243 I.C.C. 404, 407 (1941). It is also noteworthy that while each petitioner utilized several commodities in its exhibits, some of the commodities were duplicated by the various petitioners. Furthermore, there is no indication that the commodities themselves are representative of the export-import traffic consist or actually moving in the export-import trade. Many of the same criticisms can be leveled at the petitioners' selection of interior points for study. In light of the foregoing, these comparisons of car-mile earnings are not surprising, nor are they probative evidence of the unreasonableness of the entire export-import rate structure.

Petitioners also object that the initial decision did not discuss or make a finding on their request that all future general rate increases on export-import traffic moving through the various port ranges be on a uniform percentage basis. Although the Administrative Law Judge did not discuss this request, it is clear that this omission flowed from and was based upon his conclusions on the major issues presented and the absence of evidence in support of uniform percentage general rate increases on all export-import traffic moving through all port ranges.

These petitioners further allege that the competitive injury they suffer from the existing disparate rates is illustrated by a document entitled "Domestic and International Transportation of U.S. Foreign Trade: 1970,"[6] submitted by the Bureau of Enforcement in this proceeding. This submission shows that total exports produced and imports terminating in a portion of the Great Lakes ports' hinterland area were 12.3 and 15.6 percent, respectively, of the sample total pounds of goods produced and consumed in the considered area. Petitioners compare these figures with the port tonnages shown below:

TABLE 3

1970 (IN NET TONS)

Port	Imports	Percentage
Coastal ports	312,933,583	98.56
Great Lakes	4,585,996	1.44
Total	317,519,479	100.00
	Exports	
Coastal ports	205,697,712	96.81
Great Lakes	6,785,184	3.19
Total	212,482,896	100.00

According to petitioners these comparisons show that some factor is hindering the movement of export-import cargoes which should naturally move through the Great Lakes ports due to their geographic proximity. It is maintained that "experience" shows that lack of a properly related rail rate structure is principally responsible for this traffic not moving through the Great Lakes ports.

---

[6] Prepared by the Bureau of the Census, U.S. Department of Commerce.

Finally, petitioners maintain that other statistical data advanced in this proceeding and the conclusions based thereon are unsound. Thus, even though the Great Lakes ports have shown a growth pattern in tonnage handled since the opening of the St. Lawrence Seaway, petitioners suggest this growth may merely reflect a national trend of increased exports and imports. The rate of growth would assertedly provide a more meaningful comparison. In addition, they question the respondents' port tonnage statistics since tidewater port labor strife allegedly skewed the Great Lakes ports tonnage totals for 1971. Moreover, petitioners dispute the utility of the statistics on export-import rated traffic movements introduced by the Bureau.[7] They note that this study only developed traffic movements on export-import rates. Since export-import traffic through the Great Lakes ports generally moves on domestic rates, it is stated that the study was not a reasonable indicator of traffic patterns at the Great Lakes ports. Therefore, the conclusion that there was no evidence of movements of the commodities petitioners' exhibits depicted should be disregarded. Furthemore, petitioners state that, in light of the parties' knowledge and testimony that these commodities do move in export-import commerce, the Administrative Law Judge erroneously concluded that there was no showing of traffic movements.

Exceptions of the port of Green Bay are directed to the recommended denial of its request for equalization of rates on export-import traffic moving through the west bank Lake Michigan ports. This petitioner states that the record shows rates on export-import traffic moving through other port ranges are equalized, that the extremities of these equalized port ranges are up to 1,000 miles apart, and that it is prima facie unreasonable to deny west bank port equalization in light of the practice at other port ranges. It is also urged that the record amply supports this request for port equalization, that excessive distances are not involved from interior origins to the various west bank ports, and that too much weight was given in the initial decision to one example of extreme mileage variation to different west bank ports. Therefore, petitioner asks that the recommended finding on this issue be overturned.

---

[7] This data is contained in a staff report issued by the Bureau of Economics entitled "Traffic Characteristics of Import and Export Rated Shipments—Carload Waybill Statistics, 1966," taken from the Commission's 1966 rail carload waybill sample.

The Great Lakes Ports Traffic Committee excepts generally to the principal findings contained in the initial decision. It avers that the *Chicago Board of Trade* case, *supra*, established the acceptability of using domestic first-class rates to determine the existence of a rate disparity violative of section 3(1) and that respondents are clearly the common source of this undue prejudice and preference. Thus, a prima facie case assertedly has been made for the existence of undue prejudice which can only be alleviated by the prescription of rates to the Great Lakes ports based upon the same percentages of the first-class rates as are reflected by the rates to competing tidewater ports. In any event, petitioner disputes the respondents' contention that since most railroad rates are lower in absolute amounts to the Great Lakes ports than to tidewater ports the total transportation costs (land and water) must be considered in this proceeding. Petitioner takes the position that railroad rates are the only relevant transportation costs in this proceeding and that the propriety of these rates can only be measured by reference to the docket No. 28300 first-class rates as this is the sole common scale available.

The ports of Cleveland and Toledo separately filed exceptions to the initial decision which will be summarized together herein. These ports object to the findings contained in the initial decision asserting that the evidence establishes that the present rates on export-import traffic moving through the Great Lakes ports are unreasonable and unduly prejudicial. Thus, they state the key port formula for relief should be adopted in this proceeding. Additionally, Cleveland states that while it agrees with the finding that the tariff restrictions prohibiting application of domestic rates on export-import traffic are unreasonable, this finding alone will not provide for the petitioners' future need for properly related export-import rates. It is also contended that the findings and prescribed formula requested herein should extend to traffic moving to and from all territories.

The port of Toledo specifically alleges error in that the burden of proof was placed on petitioners herein, the docket No. 28300 class rates were not found to be presumptively compensatory, and the Administrative Law Judge did not find this petitioner was prejudiced by the existence of lower rates on unmanufactured tobacco moving to tidewater ports, than to the port of Toledo.

The exceptions of the State of Michigan support the finding that tariff restrictions against application of domestic rates on export-import traffic moving through the eastern Great Lakes ports are unreasonable. However, this petitioner urges it was error not to find that the domestic rates should apply as maxima. Michigan further contends that the initial decision erred in concluding that no violation of sections 1, 2, or 3(1) of the act had been established by petitioners. This allegation is based upon the contention that the Administrative Law Judge mistakenly treated this proceeding as a complaint case, thus incorrectly placing the burden of proof upon the petitioners to justify the relief sought. It is asserted that petitioners should only have been required to establish rate disparities, following which the burden would shift to respondents to provide justification for the disparate treatment or be subjected to the relief requested.

The Indiana Port Commission submits that the Administrative Law Judge's findings and conclusions on the major issues presented are in error. It states that this error was caused by the failure to treat the elements establishing undue preference and prejudice separately and distinctly in the initial decision. Thus, it is urged that he incorrectly shifted the burden of proving that different transportation conditions did not justify the rate disparities shown onto the petitioners. Indiana also argues that the evidence proves rate disparities exist, that respondents are the common source of this preference and prejudice, and that actual injury to petitioners can and should be inferred from the existence of competition between various ports and ranges. Finally, it is contended that the Administrative Law Judge erred in considering "other factors" such as ocean rates, port terminal charges, vessel sailings, et cetera, which admittedly affect the flow of traffic via different ports, instead of limiting himself to a determination based upon the statutory standards at issue.

The State of Illinois and Chicago Board of Trade jointly filed exceptions, which apply equally to the recommended findings on general commodities and whole grains including soybeans. These petitioners maintain that the initial decision does not contain a rational basis for the conclusions reached therein. Specifically, it is urged that the Administrative Law Judge did not adequately discuss the competition existing between ports and petitioners' injuries resulting from disparate rates, or the respondents' failure to justify these disparities. In this regard, petitioners urge that the burden of justifying these rate disparities was placed upon them, rather than respondents. Thus, the treatment of rail service costs was wrong as it incorrectly placed an additional burden on petitioners.

Another major error is said to have been committed in mixing the issues (1) whether undue preference and prejudice exists in the present rate structure, and if so, (2) how such preference or prejudice should be removed. According to petitioners the first issue simply requires determination of the existence or absence of elements of a section 3(1) violation. The second issue is separate and distinct. Petitioners used the docket No. 28300 first-class rates both to show the disparity in rate levels and as a suggested means of removing the undue prejudice. Thus, it is maintained that these issues were improperly confused resulting in an erroneous conclusion.

Petitioners also argue that they have met their burden of proof under section 3(1) of the act and specifically that their comparisons of port rates with the docket No. 28300 first-class rates are acceptable evidence of rate disparities, relying on the *Chicago Board of Trade* case, *supra.* Furthermore, they contend that respondents did not justify these rate disparities and that the Administrative Law Judge ignored and misconstrued the legislative history behind enactment of the 1935 amendment of section 3(1) in order to deny the relief requested. Finally, petitioners urge that the considered rates are also shown to be unjust and unreasonable by reference to the prevailing general level of rates applicable on these commodities moving to tidewater ports.

The exceptions filed by the eastern railroads relate to the finding and order that respondents' tariff restrictions prohibiting application of domestic rates on export-import traffic moving through the eastern Great Lakes ports are unreasonable and should be canceled. The respondents contend that this investigation concerns the export-import rates to and from the Great Lakes ports, rather than the domestic rates to and from the Great Lakes ports. The only relevance of the domestic rates is as a measure of the reasonableness of the assailed export-import rates. It is urged that the issue is the reasonableness of the present rate level on export-import traffic at the eastern Great Lakes ports and it was incorrect to relate any relief from such rates to the application of domestic rates. Therefore, the ultimate finding was inappropriate irrespective of the reasonableness of export-import rates to these ports. Accordingly, the contested conclusion allegedly amounts to a finding that any variance between export-import and domestic rates is unreasonable per se, which is said to be directly at odds with consistent holdings of the courts and this Commission. See *Texas & Pac. R. Co.* v. *Interstate Commerce Commission,* 162 U.S. 197 (1896); *Iron Ore from Norfolk, Va., to Toledo Dock, Ohio,* 291 I.C.C. 93 (1953); *Southern States Cooperative, Inc.,* v. *Baltimore &*

O. R. Co., 323 I.C.C. 400 (1964); and *Duluth Board of Trade* v. *Chicago & N.W. Ry. Co.*, 314 I.C.C. 695 (1961).

Based on the foregoing analysis, respondents state that it is necessary for petitioners to establish by competent evidence that the present export-import rates are unjust and unreasonable. Respondents argue that the petitioners' evidence does not establish that the rates presently applicable on export-import traffic at the eastern Great Lakes ports violate section 1 of the act.

The Commission's Bureau of Enforcement filed exceptions to the recommended findings on the major issues in this proceeding. Although the Bureau agrees that petitioners' evidence did not show the present rate structure at the Great Lakes ports is unjust and unreasonable, it contends that petitioners have established that the existing rate structure on export-import traffic moving through the Great Lakes ports is unduly prejudicial and that some of the relief requested should be granted. Although it takes no position on the finding that tariff provisions prohibiting the application of domestic rates on export-import traffic moving through the eastern Great Lakes ports is unreasonable, the Bureau states its belief that any relief for these ports should be granted under section 3(1) of the act. Thus, relief should be predicated on the key port formula since prescription of the domestic rate level on this traffic might prefer the eastern Great Lakes and prejudice other ports.

The Bureau urges that this proceeding was approached as if it involved issues of port equalization while in fact the primary issue concerns the undue prejudice existing in the rates on export-import traffic at the Great Lakes ports. Therefore, the principles enunciated in the *Meat* case, *supra*, allegedly are not applicable here and do not suggest that a port or locality should be denied the benefit of its geographic advantage under section 3(1) of the act.

The Bureau notes that the lower of two rates, in absolute amounts, may be unduly prejudicial under section 3(1) of the act. And it is well recognized that docket No. 28300 first-class rates may be used to establish rate disparities. But contrary to the implication of the initial decision such a violation assertedly does not require proof that nonprejudicial rates would be compensatory.

The Bureau also urges that petitioners have shown competitive injury recognizable under section 3(1). This injury does not have to be actual but may be only potential. In fact, based on the decision in *New York* v. *United States*, 331 U.S. 284, 307-308 and 310 (1947), it is stated that a port's injury may be inferred from relevant data. In addition, it is urged that respondents have clearly been shown to be the common source of these prejudicial and preferential rates.

Finally, the Bureau partially objects to the Administrative Law Judge's denial of petitioners' key port formula for relief. It believes that petitioners' evidence does not support either the territorial or commodity scope of their formula. Thus, it is pointed out that the evidence adduced was confined to traffic moving to and from WTL, IFA, and CFA territories and fails to support prescription of their formula on grain products or TOFC/COFC and FAK traffic. Furthermore, it is urged that any relief granted should preserve existing origin and destination rate parity groups. In this regard it is recommended that the most distant station in a group be used to establish the group's new parity level.

With regard to the export rates on whole grains and soybeans, the Bureau believes that petitioners have established a section 3(1) violation in the existing rate structure. However, the Bureau opposes the prescription of rates on these commodities at 7 percent of the first-class rate level. It urges that consistent with the decision in *Chicago Board of Trade, supra,* an alternative order for relief allowing the respondents to raise and/or lower the preferential and prejudicial rates should be entered herein.

The Great Lakes Ports Traffic Committee and the State of Michigan separately replied to the exceptions of the eastern railroad respondents and the Bureau. These parties urge that the unreasonableness of respondents' tariff restrictions prohibiting the application of domestic rates on export-import traffic moving through the eastern Great Lakes ports has been established on the record herein and that the recommended cancellation of these restrictions should be affirmed.

The Traffic Committee avers that it is prima facie unreasonable to charge different rates for identical movements and points to testimony of record that there is no difference in the character of rail service provided to domestic and export-import traffic moving through these ports. Although admitting that some railroads publish individual commodity rates to eastern Great Lakes ports which closely equate to the domestic rates, it maintains that these rates are not applicable to joint-line traffic or reasonably available to ports and shippers. Petitioner also contends that it seeks to measure the reasonableness of the present export-import rates at eastern Great Lakes ports by reference to the domestic rate level because of the large differences between these rates levels and the greater general rate increases which are usually applicable to the rates moving these ports' export-import traffic. Finally, petitioner states that removal of the considered tariff restrictions would simply recognize that there is no distinction in the handling of domestic or export-import traffic at the Great Lakes ports. Thus, it concludes that the respondents' exceptions should be rejected.

The State of Michigan maintains that the domestic rate level is relevant not merely as a measure of the reasonableness, but also as a norm for use in determining the prejudice to eastern Great Lakes ports inherent in the present rate structure on export-import traffic moving through these ports. Thus, it views the issue as the lawfulness of the present rates applicable to export-import traffic rather than the domestic rates. With this analysis in mind, Michigan states the evidence shows that domestic and foreign commerce is handled alike at the Great Lakes ports and respondents failed to establish any difference in transportation conditions to justify the higher rate level applicable on export-import traffic. Petitioner also attacks the respondents' contention that the evidence does not show any traffic diversion due to the present rate structure on export-import traffic. It is alleged that the port tonnage statistics relied upon by respondents actually show that traffic through the Great Lakes ports has been inhibited by the present rate structure. Michigan also attacks the Bureau's exceptions on this issue stating that it would deny the petitioners relief on the basis that application of the domestic rate level "may well" prefer the eastern Great Lakes ports. This position is assertedly illogical and should be rejected.

The Port Authority of New York and New Jersey replied to petitioners' exceptions by stating that the initial decision was correct and that export-import rate structures to the different port ranges cannot in law or in the public interest be placed on a rigid mileage-related basis. It is asserted that such a mileage straitjacket has been repeatedly rejected by this Commission.

This intervener states that the mileage formula proposed by petitioners would deny a fair competitive opportunity to all ports and the railroads serving them, contrary to the policy and intent of Congress when it enacted the 1935 amendment to section 3 of the act. Additionally, it is urged that petitioners seek a special port-related rate structure on short-haul traffic which does not exist at any other ports. Thus, it is pointed out that port-related rates at the tidewater ports only apply on long-haul traffic, i.e., traffic moving a minimum of approximately 400 miles to the ports. However, petitioners seek reduced port-related rates on traffic moving only

100 to 200 miles, or less. Intervener urges that such comparisons of rates on long- and short-haul traffic are invalid.

Finally, intervener argues that the evidence does not show petitioners have suffered any injury from the present rate structure or need reduced rates to compete fairly for the available traffic. In fact the record shows that Great Lakes ports' traffic has grown substantially in recent years and they usually enjoy lower actual rates than competing ports on their hinterland traffic. Intervener also asserts that petitioners failed to produce information on ocean rates and through rail-ocean rates via the different ports which is essential for determining the true competitive position of the various ports and the lawfulness of the present rail rate structure. In conclusion it is urged that the decision in *Chicago Board of Trade, supra,* dealt with a special, limited situation and should not provide a general rule for determining rate disparities based upon percentages of docket No. 28300 first-class rates for application on all commodities moving between interior points and different ports. Adoption of such a mileage formula would be highly disruptive of long-established rate structures and highly injurious to the Nation's commerce.

The eastern railroads note that petitioners take *pro forma* exception to the finding that the rates on export-import traffic moving via the Great Lakes ports have not been shown to be unjust and unreasonable. They state that the initial decision clearly points out the legal insufficiency of the evidence presented to establish this violation of the act, and petitioners have offered nothing to indicate that this finding was incorrect.

On the issue of undue prejudice in the rate structure to the Great Lakes ports, respondents state there is no argument that a section 3(1) violation requires petitioners to show that a rate disparity exists and that injury results therefrom. Instead, it is urged petitioners are attempting to obscure the fact that they did not meet their burden on these points. Thus, respondents point out that the Great Lakes ports were shown to have an absolute rate advantage over the tidewater ports and the present rates were not shown to be a source of injury to the Great Lakes ports. The Administrative Law Judge, therefore, properly refused to find that a showing of percentage disparities in rates constituted proof of undue preference and prejudice.

It is also alleged that petitioners rely upon a presumption of injury based on the competition between ports. Yet respondents pointed out that even the existence of competition is assumed since no evidence was presented of actual movements of the commodities utilized in petitioners' exhibits. Furthermore, the issue of injury must give consideration to the relative growth patterns of port regions. This consideration allegedly shows the absence of injury to petitioners. Finally, respondents urge the contention that a mere showing of competition satisfies the "injury" requirement of section 3(1) has no basis in Commission or court decisions. They note that *Chicago Board of Trade, supra,* is the only proceeding in which this Commission has found a violation of section 3(1) where the complainant (a) enjoyed a quantum rate advantage, (b) "suffered" from rates reflecting a higher percentage of first-class than those of its competitors, and (c) showed no injury from either the rate advantage or percentage disadvantage. It is urged that the preceding case should be limited to its particular factual situation and that the Commission should return to the principles enunciated in *American Colloid Co.* v. *Akron, C. & Y. R. Co.,* 321 I.C.C. 91 (1963).

In conclusion, respondents argue that except for a few dissimilar cases, the decisions of this Commission contain no support for the prescription of petitioners' key port formula which would freeze export-import rates into a strict distance relationship.

The Southern Ports Foreign Freight Committee and Western Trunk Line Committee railroads jointly replied to the exceptions herein. Essentially these respondents contend that competition is controlling in the matter of port relationships and distances are generally disregarded. Therefore, they urge that if distances become of controlling importance, past precedent will be voided and port equalization will disappear contrary to congressional intent.

Respondents state that Green Bay's request for equalization of rates at west bank Lake Michigan ports is not supported by facts of record but instead reveals that alleged rated disparities based on percentages of first-class rates have no bearing upon this port's ability to secure traffic. Therefore, it is concluded that Green Bay's request for equalization was correctly denied.

These respondents also allege that the petitioners' exceptions display their failure to understand the requirements to prove a violation of either section 1 or 3(1) of the act. Thus, they presented no evidence of commodity movements on the allegedly disparate rates or of any injury stemming from the present rates. Instead they relied upon a difference in rate levels and general declarations of competition which will not suffice to establish the unlawfulness of these rates. In summary, respondents state that the burden of presenting facts to establish a violation of the act was properly placed upon the petitioners. However, they did not meet their burden on the record. Furthermore, the petitioners' limited hypothetical rate comparisons were not shown to be on representative commodities moving from and to representative interior territory points. On these bases, respondents contend that the record will not support finding the present rates unlawful and prescription of the requested relief.

DISCUSSION AND CONCLUSIONS

Prior to our discussion of the issues presented in this proceeding several preliminary matters must be resolved. Initially, two petitioners question the propriety of designating Great Lakes ports interests as "petitioners" and placing the burden of showing a prima facie violation of the Interstate Commerce Act upon these parties. One party notes that this is an investigation proceeding instituted upon the Commission's own motion under section 13(2) of the act. It is somehow inferred from this background that the burden should have been shifted requiring respondents to establish the lawfulness of the present rate structure on export-import traffic moving through the Great Lakes ports. Additionally, it is contended that the initial decision intimated petitioners were required to establish the existence of undue preference and prejudice in each and every rate on export-import traffic moving through the Great Lakes ports in order to prevail. Finally, Michigan urges that the Administrative Law Judge erroneously treated this proceeding in the manner of a complaint, thus placing an improper burden upon the petitioners. Allegedly, these petitioners should only be required to establish the existence of unequal treatment in the present rate structure, whereupon the burden should shift necessitating respondents to justify such unequal treatment.

It is clear from the foregoing that these petitioners have overstated their position and attributed to this Commission authority it does not possess. Although this investigation was instituted upon the Commission's own motion, it was instigated by petitioners' allegations of unequal treatment. If allegations of unequal treatment are assumed to be correct, it is nevertheless necessary for petitioners, as proponents of change in the present rate structure, to establish that the present rate structure is in some manner inconsistent with the act. Furthermore, we note petitioners' anxiety that an impossible burden has been placed upon them to show that each and every rate is unduly prejudicial. This apprehension is not well founded as the Commission has never held that every rate must be shown unlawful in a proceeding considering the lawfulness of an entire rate structure. Similarly, petitioners were only required herein to meet their burden with relevant, competent, and fairly representative evidence.

In testimony as well as on brief and exceptions the Port Authority of New York and New Jersey contends that petitioners' failure to produce data on ocean rates and through rail-ocean rates or other transportation conditions affecting traffic movements via the different ports is fatal to their position herein. Intervener views this proceeding as involving only port competitive opportunities under section 3(1) of the act as in port-related rate and port rate equalization cases. Thus, it cites *Export and Import Rates to and from Southern Ports*, 205 I.C.C. 511, 518-20 (1934), and *Equalization of Rates at North Atlantic Ports*, 311 I.C.C. 689, 693-96 (1960), for the proposition that ocean rates are relevant and indeed necessary in order to determine the competitive position of different ports, as well as to establish port-related or equalized rate structures providing each port with the opportunity to compete for and handle the Nation's foreign commerce in consonance with section 3(1) of the act.

There is no dispute that this Commission has on occasion considered ocean rates and total or through transportation costs in determining the lawfulness of port-related and port-equalized rates. However, it should be noted that this was done at the request of the parties therein and upon a specific showing of the relevance of such information. The instant proceeding stands on different ground. Here, we are not presented with contentions of a complete inability to compete based on total transportation charges which would justify the prescription of port-related or equalized rates. Indeed, petitioners do not seek rates equalized with or directly related to those of the tidewater ports, such as within and between the gulf and North Atlantic ranges. In addition, no competent evidence of ocean rates or through transportation costs has been proffered. Thus, we view the issues herein as being substantially more limited than those presented in the proceedings cited by intervener. Petitioners contend that the basic evil sought to be eliminated by section 3(1) exists in respondents' present export-import rate structure. They request that this burden be alleviated, but not by the imposition of port-related rates instead, they ask for export-import rates to the Great Lakes ports which are properly related to distance and costs of service. In summary, while recognizing the inherent relationship between proceedings involving port-related rates, port-equalized rates, and the more typical section 3(1) proceeding, we believe that the issues herein can and should be decided without reference to port-related rates or port equalization.

Several petitioners as well as the Bureau also object to the treatment accorded cost evidence in the initial decision. There the Administrative Law Judge noted the lack of any cost evidence in this record. He stated that the relation of rail costs to the rates at issue could have been used as a measure of the disparity in rail rates at the Great Lakes ports, but that petitioners relied upon their reference to percentages of the docket No. 28300 first-class rates. Furthermore, petitioners contended that they had no obligation or burden to show the lower rates proposed under their formula were compensatory. It was concluded that the docket No. 28300 rates could not be presumed compensatory due to the fact that they had been approved so long ago. Cf. *Iron or Steel Cans from New Orleans, La., to Georgia,* 310 I.C.C. 543, 544 (1960). Finally, the initial decision noted that since the petitioners request adoption of a specific formula they must show that the rates thereunder generally would be compensatory.

Although it is clear that petitioners are not required to submit cost evidence in a typical section 3(1) proceeding, as the Administrative Law Judge stated they can do so to establish the existence of a rate disparity. In addition, the respondents herein, or defendants in a complaint proceeding could introduce cost evidence to justify any existing rate disparities, but they need not do so. However, such a typical section 3(1) proceeding which resulted in a finding of undue preference and prejudice would usually lead to no more than an alternative order requiring defendants to raise or lower, or raise and lower the unduly preferential and prejudicial rates.

In the instant proceeding petitioners seek more than the normal alternative order. They request prescription of the key port formula under authority of section 15(1) of the act, which would require respondents to lower the contested rates. Since petitioners request such a prescription the burden is theirs to produce evidence justifying such action, including relevant and competent evidence establishing the compensativeness of the level of rates to be prescribed. However, this issue need only be reached if petitioners meet their burden under section 3(1) of the act.

Prescription of shipside rates.—As noted above the initial decision recommended denial of Burrus's request for prescription of shipside rates subject to a 12-cent-per-100-pound waterborne charge on grain products exported through the Great Lakes ports. Although this petitioner did not file exceptions to the initial decision the evidence on this point has been reviewed. The statement and conclusions thereon are complete and accurate, and therefore, will be affirmed and adopted as our own.

Equalization of Rates.—In support of its requested equalization of rates at the west bank Lake Michigan ports of Chicago, Green Bay, Kenosha, and Milwaukee on export-import traffic moving to and from a described portion of WTL territory including Montana, Green Bay. Green Bay argues that its port facilities are operating at only 25 to 30 percent of their capacity.[8] It is further contended that the following table demonstrates Green Bay's inability to attract foreign commerce due to higher rail rates than others west bank ports.

TABLE 4

Total general cargo exports and imports thru the port of Green Bay, Wis., for the years 1970, 1971, and 1972, on overseas traffic. (Figures are in gross tons of 2,240 pounds.)

Cargo	Exports		
	1970	1971	1972
Corn meal	1,365	410	816
Flour	9,833	30,438	23,528
Bulgur	11,376	20,659	4,430
Milk, dried	3,605	8,230	1,857
Wheat soya blend	-----	1,173	19,978
Corn soya milk	8,643	-----	156
Rolled oats	-----	-----	929
Whey powder	-----	992	-----
Malt	-----	-----	993
Meat, frozen	-----	-----	459
Hides	-----	106	1,187
Tallow	-----	-----	1,145
Lignin pitch	222	559	-----
Bentonite	-----	2,684	-----
Weed killer comp.	-----	105	-----
Machinery	278	101	44
Miscellaneous	2	64	96
	35,324	65,523	56,018

---

[8] Similar evidence regarding port facility utilization was removed from the record for lack of substantiating testimony.

Total general cargo exports and imports thru the port of Green Bay, Wis., for the years 1970, 1971, and 1972, on overseas traffic. (Figures are in gross tons of 2,240 pounds.)—Con.

Cargo	1970	1971	1972
		Imports	
Barbed wire	34	-----	61
Plywood	-----	19	143
Arsenic trioxide	5,152	3,756	4,944
Twine, baler, binder	958	590	2,727
Piling, steel	-----	-----	3,250
Woodpulp, foreign	9,750	4,123	2,817
General cargo	--------	597	869
Machinery	-----	-----	8
Chemicals	976	-----	-----
Miscellaneous	4	-----	62
	16,874	9,085	14,881

Based on the foregoing, petitioner maintains that more than 90 percent of its export traffic consists of agricultural commodities moving under U.S. Department of Agriculture relief programs.[9] This traffic is said to originate at points in Colorado, Kansas, Missouri, and Nebraska where Green Bay has equalized rates with other west bank ports. The remainder of petitioner's foreign traffic originates or terminates locally. In addition, petitioner alleges an inability to attract agricultural relief commodities from points in Iowa because rates from those points are not equalized to the west bank ports.

In further support of this request petitioner points out that it only seeks equalization of ports located within a range of 200 miles on the west bank of Lake Michigan. In contrast, ports located in the gulf range are up to 900 miles distant from one another and those located in the south Atlantic range are up to 400 miles apart. It is also contended that some equalized ports within the north Atlantic range are located only 250 miles from the eastern boundary of their equalized territory. While, for example, Green Bay is 214 miles from the nearest point (Winona, Minnesota) in the territory it would have equalized. Furthermore, petitioner states that it is 1,081 miles from Denver, Colo., only 54 miles more distant from that point than

---

[9] These commodities apparently are purchased and transported under Public Law 480, "The Agricultural Trade, Development and Assistance Act of 1954."

Milwaukee; 556 miles from Omaha, Nebr. and 420 miles from Fort Dodge, Iowa, which are 59 and 54 miles further than Milwaukee, respectively.

The Seaway Port Authority of Duluth opposes Green Bay's request for rate equalization at west bank ports. It points out that the petitioner's evidence did not disclose how such equalization would be accomplished, i.e., which port's rates would apply between WTL territory and the west bank ports. Furthermore, it is contended that granting petitioner's request would result in equalization of rates from such points as Clinton, Iowa, and Savannah, Ill., which are only 138 docket No. 28300 miles from Chicago, in contrast with the typical 300- to 400-mile distance between the North Atlantic ports and their equalized territory and 500 miles from the closest gulf port to the nearest point in SPFFC equalized territory.

The railroad respondents as well as the Bureau also oppose petitioner's request for port equalization. They generally take the position that Green Bay is unclear as to which west bank port would be the ratemaking point or the effect such equalization would have upon the proposed key port formula. It is also alleged that without probative rate comparisons between the proposed equalized territory and the west bank ports on general-commodity traffic, it would be impossible to designate a ratemaking point and unjustifiable to grant the request for rate equalization.

Initially, the inherent inconsistency of Green Bay's supporting the petitioners' key port formula and simultaneously requesting the prescription of equalized rates at west bank ports should be noted. On the one hand, it espouses the position that export-import rates should be related to rail distances to avoid undue prejudice, while on the other hand, it asks that rail distances be disregarded so that Green Bay might become a more competitive port. In any event, one of the purposes of section 3(1) of the act is to permit all ports and the carriers serving them to compete for traffic and thereby maximize the number of ports available to serve the Nation's commerce. *Boston and Maine R.R.* v. *United States,* 202 F. Supp. 830, affirmed 373 U.S. 372. It is also well established that we may permit, or indeed require, port equalization within reasonable limits. See *Port Arthur Cham. Comm. & Shipping* v. *Aberdeen & R. R. Co.,* 169 I.C.C. 753, 758, and cases cited therein. Therefore, the question for determination is whether petitioner Green Bay has proffered the quantum of evidence necessary to justify west bank port equalization.

As noted, Green Bay relies upon a showing of export-import tonnages to establish its inability to compete with other west bank ports for foreign commerce. However, these statistics alone, or in conjunction with the unsubstantiated assertion that higher rail rates are prevalent to the port of Green Bay, do not establish that Green Bay is being disadvantaged vis-a-vis other west bank ports. Petitioner's evidence that 90 percent of the export tonnage handled at the port originated in four States from which rates are equalized to the west bank ports is of greater significance. But this evidence is also of limited value since (1) it relates only to agricultural commodities while petitioner seeks equalization of the rates on general commodities, and (2) petitioner has presented no evidence that agricultural commodities, such as those produced in Iowa, move through other west bank ports to its disadvantage.

Petitioner also seeks to justify this request for equalization by reference to the fact that ports in other ranges have been granted equalized rates. These comparisons with other port ranges are unavailing absent a showing of similar circumstances and conditions at the west bank ports, a demonstration which has not been made on this record. Similarly, petitioner's citation of the distances between equalized ports within a port range, and the distances from a particular port to that port ranges' equalized rate territory are not controlling. Of greater moment is the selection and justification of a key ratemaking point and the different distances between representative points within the proposed equalized territory and the ports for which equalization is requested. Petitioner has failed to produce any probative evidence on these essential matters. Therefore, the recommended finding on this issue will be affirmed and the requested equalization of rates at west bank Lake Michigan ports is denied.

Section 1(5) issues.—The petitioners present two arguments in support of their assertions that the rates applicable on general commodities, grain products, TOFC/COFC, and FAK export-import traffic moving through the Great Lakes ports are unjust and unreasonable. First, relying upon the same evidence offered to prove that the contested rates are unduly prejudicial, petitioners urge that these rates are shown to be unreasonable by comparison of the different, higher percentages of the docket No. 28300 first-class rates reflected by the rates applicable on export-import traffic moving through their ports with the corresponding rates to and from the North Atlantic and gulf ports. Second, the eastern Great Lakes ports state that the rates applicable on export-import traffic moving through their ports are shown to be unreasonable by comparison with the lower rates applicable on domestic traffic moving between the same origins/destinations and these ports. These arguments will be considered in order.

As noted previously, the Administrative Law Judge concluded that petitioners' evidence showing that different percentages of the docket No. 28300 first-class rates were reflected by the rates on this traffic when moving between interior points and Great Lakes ports than the corresponding rates to tidewater ports, did not establish a violation of section 1 of the act. Moreover, he stated that the reasonableness of a rate depends upon a consideration of many factors which petitioners' evidence did not address and that the proffered comparisons were of little value since petitioners submitted no evidence on other considerations affecting the different levels of these rates.

Several petitioners contend that this conclusion was erroneous. They assert that the comparisons presented of rates and car-mile earnings[10] on various commodities moving between interior points, the Great Lakes, and tidewater port ranges, as well as the relationship of these rates to the docket No. 28300 first-class rates establishes a section 1 violation. Petitioners also argue that rates may be shown unreasonable in relation to one another, or relatively unreasonable as in the *Sterling* case, *supra,* and urge that this test has been met in the instant proceeding.

In cases too numerous to require citation the courts and this Commission have held that there exists a zone of reasonableness within which carriers are ordinarily free to adjust their rates. It is clear then that there is not one reasonable rate on a commodity transported between various points, but a continuum ranging from the minimum to the maximum reasonable rate levels. It requires but one more step to conclude that rates cannot be found unjust and unreasonable without reference to an identifiable and acceptable standard of measurement, based upon similar transportation conditions.

Petitioners rely upon the doctrine of "relative unreasonableness" and the *Sterling* case, *supra,* to support the contention that these rates are shown unreasonable merely by reference to the docket No. 28300 scale of first class rates. However, we do not subscribe to the belief that *Sterling, supra,* altered the requirement for a satisfactory standard with which to test reasonableness. The matter quoted therefrom states at page 536 of 339 I.C.C. 530:

---

[10] See the discussion of car-mile earning comparisons earlier in this report.

> A rate may be unreasonable in relation to another, or relatively, as a result of comparing the two. A rate likewise may be unreasonable in relation to cost, in relation to a prescribed basis of rates, *or in relation to any other satisfactory standard* which permits us to measure and determine the factual question presented. Broadly, then, it may be said that every unreasonable rate is "relatively unreasonable." Therefore, *all* factors in the evidence of record must be taken into account, and no single one is determinative in establishing the reasonableness or unreasonableness of assailed rates pursuant to section 1(5) of the act. *** [Emphasis in original.]

This quotation does not support the contention that rates may be found "relatively unreasonable" without reference to an acceptable standard.

It should also be noted that the decision in *Sterling, supra,* had a significantly different factual basis than the instant proceeding. There complainant alleged that the grouping of Sterling, Colo., with three substantially more distant Colorado points on TOFC shipments of meat and meat byproducts to Chicago was unlawful. It was pointed out that the rates on such TOFC shipments were established on a *mileage basis.* Thus it was proper to test the reasonableness of those rates by reference to a scale solely or primarily reflecting distance. Petitioners herein cannot and do not allege that distance is the sole criterion in establishing rates on export-import traffic, and, therefore, a distance scale alone is not a proper standard to measure their reasonableness.

One of the best tests of the reasonableness of rates is a comparison thereof with other rates on like traffic in the same general territory. See *Emery Common Carrier Rates—Various Commodities,* 326 I.C.C. 415, 420; *Trimount Bituminous Products Co.* v. *Bangor & A. R. Co.,* 304 I.C.C. 513, 515; and *Maple Island Farm, Inc.,* v. *Chicago, B. & Q. R. Co.,* 280 I.C.C. 353, 356. However, the probative weight which can be accorded to such comparisons is directly dependent upon the proponent's establishing that similar transportation conditions attend both sets of rates. While such similar conditions can sometimes be assumed, that is not the case herein because of the wide geographic scope of the rates at issue. Some of these transportation conditions include: the length of haul; the similarities or differences in operating conditions; the number of multiple line-hauls; the volume of traffic movement; the balance of traffic; the competition experienced; and commercial necessities.

Instead of addressing themselves to a consideration of these factors, petitioners' exhibits merely reveal the rates applicable on various commodities from several interior points to different tidewater and Great Lakes ports. They also show the percentages of docket No. 28300 first-class rates reflected by these rates and in some instances the car-mile earnings therefrom. These exhibits demonstrate, although petitioners do not mention it, that the compared rates are not for movements within the same territory, unless the entire country east of the Rocky Mountains be considered one territory. Thus, it is proposed to compare rates for movements ranging from 500 to 1,000 miles, with those for movements of 100 to 500 miles. Finally, as the Administrative Law Judge so aptly noted, petitioners made no attempt to establish the representativeness of the commodities or points selected for comparison purposes. This deficiency is particularly significant because of the vast scope of the findings and relief sought herein. In summary, we conclude that petitioners have not shown that the rates presently applicable on general commodities, grain products, TOFC/COFC, and FAK export-import traffic moving to and from the Great Lakes ports are unjust and unreasonable.

The allegation that tariff restrictions prohibiting the application of domestic rates on export-import traffic moving through the eastern Great Lakes ports are unjust and unreasonable is also based upon rate comparisons. However, on this issue the Administrative Law Judge concluded that respondents' sole rationale for retention of these tariff restrictions was their fear of a reduction in revenues should the domestic rates apply and that these restrictions resulted in an unwarranted closing of interstate rail routes. It was, therefore, recommended that these restrictions be found unreasonable and ordered canceled.

Several petitioners endorse the recommended finding on this issue. However, the State of Michigan insists that the failure to order application of domestic rates as maxima on all export-import traffic moving through the eastern Great Lakes ports was in error. On the other hand, the railroad respondents contend that the recommended finding and order are incorrect. They state that the issue herein is the reasonableness of the present rate scale applicable to export-import traffic moving through the eastern Great Lakes ports. Therefore, the domestic rate scale is only relevant as a measure of the reasonableness of these rates and it was incorrect to relate any relief granted from such rates to the application of the domestic rail scale.

Prior to considering the evidence relied upon by petitioners to establish the unreasonableness of the assailed rates a few words should be said to clarify this issue. Despite vigorous rhetoric to the contrary from several petitioners, the fact that rates applicable on export-import traffic moving between interior points and the eastern Great Lakes ports differ from, and are higher than domestic rates on similar commodities moving between the same points creates no presumption that the former are unreasonably high. One might just as easily conclude that the latter are unreasonably low. This comports with the oft-stated proposition that mere rate disparities do not establish unlawfulness and with our previous conclusion that the weight to be accorded rate comparisons depends upon a showing of similar transportation conditions. In addition, both the courts and this Commission have refused to find that any difference between export-import and domestic rates is presumptively unreasonable on the basis that such differences may be justified by dissimilar transportation conditions. Cf. *Texas & Pac. R. Co.* v. *Interstate Commerce Commission, supra.* Therefore, as the assailed rates are in existence and of long standing the petitioners must bear the burden of proving them unreasonable.

Prior to publication of the docket No. 28300 class rates and the docket No. 28310 Uniform Classification, rail rates in official territory[11] were subject to the docket No. 15879 scale of class rates and the official classification. See *Eastern Class-Rate Investigation*, 164 I.C.C. 314 (1930), and *Consolidated Classification Case*, 4 I.C.C. 1 (1919), respectively. At that time railroad rates published expressly for application to export-import traffic took precedence over the domestic rates on foreign traffic. However, where there was no export-import rate published, the domestic rate was applicable whether it was a class, exception, or commodity rate.

In order to facilitate the change from the old to the new rate scale and classification the railroads in official territory published an interim tariff replacing the former exceptions ratings and rates. This column commodity tariff was effective for approximately 12 years but an item therein prohibited application of those rates to export-import traffic, thus preserving the prior level of rates on domestic traffic but denying the same level of rates to foreign traffic.

---

[11] This territory includes the major portion of the IFA, CFA, TL, TLA, and New England territories.

Subsequently, this restriction was removed, except on export-import traffic moving through the North Atlantic ports. (See TL tariff E-180, I.C.C. A-1059, item 224 and Supplement 166 to the tariff.)

When the docket No. 28300 class rates were published in Trunk Line-Central Territory Railroads Class Tariff No. E-1009-A, I.C.C. C-391, items 210 and 215 therein made all export-import traffic subject to the prior rate scale. Later Supplement 80 caused application of the new class rates on export-import traffic, item 210 was canceled, and 215 was changed to apply competitive (presumably lower) class rates to export-import traffic moving through the North Atlantic ports and the regular level of class rates to all other ports.

The docket No. 28300 proceedings resulted in the publication of 12 class rate tariffs. A companion tariff was published for each of these class tariffs which contained exceptions ratings and column commodity rates. As a whole these tariffs contain the domestic rail rates applicable throughout the United States from Denver, Colo., to the east coast. In all but two of these tariffs the domestic rates also generally apply to export-import traffic. The exceptions are Trunk Line-Central Territory Railroads tariffs E-2009H, I.C.C. C-733, applicable within official territory, and E/W-2010-I, I.C.C. C-737, applicable between official and WTL territories. These tariffs prohibit the application of exceptions and commodity rates on export-import traffic.

Thus, the west bank Lake Michigan ports from Chicago north, and the Lake Superior ports, as well as the Gulf, Florida, and South Atlantic ports have access to the entire domestic rate structure, i.e., class, commodity, and exceptions rates, for application to export-import traffic, while the eastern Great Lakes ports are restricted to domestic class rates and those exceptions or commodity rates published by individual carriers. The restrictions contained in E-2009 and E/W-2010 series tariffs also apply to export-import traffic moving through the North Atlantic ports. However, those ports have commodity rates specifically applicable to their export-import traffic published in both agency and individual tariffs.

Based on the foregoing tariff situation petitioners point out that a manufacturer located in CFA territory can ship identical carloads from the same origin point over exactly the same route to the same terminal point and yet pay a higher charge on the export carload than on the domestic carload. In contrast, this situation does not exist at the other port ranges mentioned. Furthermore, where different rates apply depending upon the nature of the traffic it is alleged that abuse and manipulation can be expected.

To further support its contention that the present rate structure on export-import traffic moving through the Great Lakes is unreasonable, the port of Toledo presented several exhibits comparing railroad rates on various commodities between interior points, and Toledo and tidewater ports. Some of this evidence is summarized in the following table:

TABLE 5

Commodity and origin (1)	Destination (2)	Docket No. 28300 mileage (3)	Docket No. 28300 1st-class rate (4)	Domestic rate and MW (5)	Export-import rate and MW (6)	Percentage (col. 6 ÷ col. 4) (7)	Car-mile earnings (8)
Tobacco, unmanufactured							
Covington, Ky	Norfolk, Va	656	525	76/40M	117/20M	22.2	36
Do	do			55/excess 40M	96/40M	18.3	59
Do	Toledo, Ohio	197	289	83/40M	82/40M	28.4	167
Agricultural machinery							
Coldwater, Ohio	Baltimore, Md	581	495	129/40M	104/40M	21.0	72
Do	New York, N.Y	723	561	161/40M	104/40M	18.5	58
Do	Toledo, Ohio	103	230	59/40M	58/40M	25.2	225
Rubber, crude, artificial							
Louisville, Ky	Baltimore, Md	670	532	135/30M	116/70M	21.8	121
Do	do			99/excess 30M	113/90M	21.2	152
Do	New York, N.Y	834	610	155/30M	119/70M	19.5	100
Do	Toledo, Ohio	298	348	87/30M	122/60M	35.1	246
Do	do			79/excess 30M			
Greases, inedible							
Columbus, Ohio	Baltimore, Md	479	439	83/60M	66/60M	15.0	83
Do	do			80/75M	60/75M	13.7	94
Do	do			66/150M			
Do	New York, N.Y	621	513	98/60M	66/60M	12.9	64
Do	do			92/75M	60/75M	11.7	73
Do	do			76/150M			
Do	Toledo, Ohio	125	244	52/60M	61/60M	25.0	293
Do	do			49/75M	In tank cars.		
Do	do			39/150M			

See notes at end of table.

Commodity and origin (1)	Destination (2)	Docket No. 28300 mileage (3)	Docket No. 28300 1st-class rate (4)	Domestic rate and MW (5)	Export-import rate and MW (6)	Percentage (col. 6 ÷ col. 4) (7)	Car-mile earnings (8)
Brass or bronze bars							
Baltimore, Md	Middletown, Ohio	541	476	105/40M	113/40M	23.7	84
Do	do			95/100M	60/100M	12.6	111
New York, N.Y	do	690	543	119/40M	114/40M	20.9	66
Do	do			109/100M	80/100M	14.7	116
Toledo, Ohio	do	143	258	58/40M	90/40M	34.9	252
Do	do			53/100M	----------		----------
Lead, lead base bullion							
Baltimore, Md	Muncie, Ind	614	503	111/40M	116/36M	23.1	68
New York, N.Y	do	756	571	126/40M	122/36M	21.4	58
Toledo, Ohio	do	156	264	58/40M	92/36M	34.9	212
Zinc pigs or slabs							
Baltimore, Md	Maysville, Ky	554	476	105/40M	99/36M	20.8	64
New York, N.Y	do	718	553	122/40M	102/36M	18.4	51
Toledo, Ohio	do	260	328	72/40M	98/40M	29.9	151

Note: Rail rates at tidewater ports were also subject to a waterborne charge of 12 cents per 100 pounds.

MW stands for minimum weight factor.

M refers to thousands (000) of pounds.

This table shows that the rates to Toledo are lower in actual amount than those to the North Atlantic ports. However, it also indicates that export-import rates to the North Atlantic ports are usually, but not always, lower than the corresponding domestic rates in actual amount for the same minimum weight shipment. In contrast, a similar comparison of the domestic and export-import rates to Toledo shows that the domestic rates are often lower than the applicable export-import rates to this point. Furthermore, the percentages of the docket No. 28300 first class rates reflected by the export-import rates to the North Atlantic ports are generally lower than the corresponding percentages of the export-import rates to Toledo. Finally, there appear to be significant differences in the car-mile earnings between the compared rates to North Atlantic ports and Toledo.

The port of Cleveland submitted exhibits based on similar rate comparisons. This evidence, which is illustrated in the following table, reflects the existence of some disparities in the present rate structure. For instance, while the rates to Cleveland are lower in actual amount, they generally reflect higher percentages of the first-class rates and produce far greater car-mile earnings. On the other hand, the export-import rates to both Baltimore and Cleveland generally exceed comparable domestic rates, although by differing amounts. However, the value of these comparisons is diminished somewhat due to the fact that the compared rates apply to different minimum weights and for significantly different distances.

TABLE 6

Commodity and origin (1)	Destination (2)	Docket No. 28300 mileage (3)	Docket No. 28300 1st class rate (4)	Domestic rate and MW (5)	Export-import rate and MW (6)	Percent first-class (7)	Car-mile earnings (8)
Machinery							
Cincinnati, Ohio	Baltimore, Md	560	476	164/36M	176/36M	36.9	113
Do	Cleveland, Ohio	239	314	--------	141/24M	44.9	142
Glass, window							
Stony Point, Pa	Baltimore, Md	401	412	86/50M	84/50M	20.4	105
Do	do			--------	71/70M	18.0	124
Do	Cleveland, Ohio	112	236	46/50M	83/40M	35.2	296
Mount Vernon, Ohio	Baltimore, Md	477	439	92/50M	95/50M	21.6	100
Do	do			--------	81/70M	18.5	119
Do	Cleveland, Ohio	115	236	46/50M	83/40M	35.2	289
Glass fiber rovings							
Charleston, W. Va	Baltimore, Md	432	419	93/30M	168/30M	40.1	117
Do	do			--------	--------	--------	--------
Do	Cleveland, Ohio	289	348	81/30M	139/30M	39.9	144
Rayon staple fiber							
Parkersburg, W. Va	Baltimore, Md	336	390	84/30M	87/40M	22.3	95
Do	do			--------	71/60M	18.2	116
Do	Cleveland, Ohio	199	289	68/30M	116/30M	40.1	175
Books							
Willard, Ohio	Baltimore, Md	485	448	146/24M	128/60M	28.5	158
Do	Cleveland, Ohio	79	205	80/24M	82/30M	40.0	311

MW stands for minimum weight factor.
M refers to thousands (000) of pounds.

The only tangible evidence presented by the State of Michigan consists of rate comparisons on agricultural implements moving from a Michigan point to Detroit and Tidewater port. This comparison is depicted in table 7, following:

TABLE 7

Origin (1)	Destination (2)	Docket No. 28300 mileage (3)	Docket No. 28300 1st class rate (4)	Domestic rate and MW (5)	Export rate and MW (6)	Percentage first first class (7)
Battle Creek, Mich	New York, N.Y-	751	571	218/20M	114/40M	19.9
Do------------------	-----do-------------			200/24M	106/200 NT	
Do------------------	-----do-------------			184/30M	96/400 NT	
Do------------------	-----do-------------			165/40M		
Do------------------	-----do-------------			155/50M		
Do------------------	Detroit, Mich----	121	244	89/20M	110/24M	45.1
Do------------------	-----do-------------			81/24M		
Do------------------	-----do-------------			68/30M		
Do------------------	-----do-------------			60/40M		

Note: NT stands for net tons (2,000 pounds).
MW stands for minimum weight factor.
M refers to thousands (000) of pounds.

The domestic rate on this commodity is shown to be significantly lower than the export-import rate at comparable minimum weights via the port of Detroit. In addition, this exhibit shows a wide divergence in the percentages of the first class rates reflected by the export-import rates to New York and Detroit. It is also shown that the export-import rate to New York is lower than the comparable domestic rate, while, as noted, the opposite is true to Detroit.

Finally, a witness for the State of Michigan alleged that railroads do not provide any different services on foreign than domestic traffic at the Great Lakes ports. In addition, another Detroit witness testified that rail service is the same for domestic or export-import traffic at his terminal insofar as pickup and delivery service is concerned. However, he did not testify as to any similarities or differences in demurrage or detention time for domestic and export-import traffic.

Replying to these contentions, the eastern railroad respondents presented testimony that the percentage of docket No. 28300 first-class rates reflected by various export-import rates is not invariably higher to the Great Lakes ports than to the North Atlantic ports.

They also aver that the eastern roads have not been remiss in acting upon proposals to establish competitive export-import rates through the Great Lakes ports, as evidenced by the many commodity rates on such traffic published in both agency and individual line tariffs. It is noted that the petitioning ports presently have the advantage of lower rates, in absolute terms, in addition to geographic proximity when compared with the North Atlantic ports.

Regarding the port of Toledo's rate comparisons (see table 5, *supra*) respondents state that unmanufactured tobacco moves to various ports for processing prior to overseas shipment. Since there are no processing facilities located on the Great Lakes it is improbable that any shipments would move in that direction regardless of the rate level in effect. The agricultural machinery illustration assertedly has lower rates at greater minima simply because such rates and minima have not been requested by Great Lakes ports interests. It is also pointed out that Toledo enjoys a rate on this commodity at a minimum weight of 40,000 pounds which is 27 cents per hundred pounds lower than the most favorable east coast rates applying to a minimum of 200 net tons. The foregoing explanations also are said to apply to other commodities and rates depicted by petitioners.

Respondents reject the contention that domestic rates should be made applicable on export-import traffic moving through these Great Lakes ports. They state that petitioners overlook the different transportation conditions affecting domestic and export-import traffic. It is explained that motor carrier competition is extremely intense for domestic traffic, but not for export-import traffic. This results from the fact that export-import traffic moves in significantly greater quantities per shipment due to the economics of ocean transportation. Because of these large quantities, the traffic is allegedly not subject to motor carrier diversion. Furthermore, respondents note that demurrage and detention rules and charges are significantly different on export-import traffic than on domestic traffic. For example, it is pointed out that allowable free time for rail car unloading or loading on export-import traffic differs greatly from that on domestic traffic. In conclusion, the respondents note that application of domestic rates on the considered export-import traffic would significantly reduce their revenues without justification.

As noted previously, the Administrative Law Judge found that the eastern railroad respondent's tariff restrictions resulted in an unwarranted closing of interstate rail routes which was unreasonable. This conclusion was based upon consideration of the history of these tariff restrictions in conjunction with a prior Commission decision holding that "the rails of an interstate carrier must be open from one end to the other with no restriction whatsoever except such as naturally flows from the right of the carrier to demand and receive a reasonable compensation for each particular service of transportation." See *Delaware, Lackawanna & W. Coal Co.* v. *Central R. of N. J.*, 185 I.C.C. 168 (1932). We disagree with the rationale employed by the Administrative Law Judge.

In *Delaware, supra,* a carrier canceled through routes on coal from origins on another line to destinations on its own line. By this action the carrier sought to protect coal producers located on its line from the competition of producers located on another carrier's line. After finding that a ready market existed for complainant's coal but that the assailed rates which resulted from the cancellation of the through route precluded movement of this coal into defendant's service area, the Commission concluded that cancellation of this through route was unreasonable and unduly prejudicial.

The record in this proceeding establishes the existence of an entirely different situation. First, none of the parties in this proceeding has even contended that the assailed tariff restrictions and export-import rates preclude the movement of traffic through the eastern Great Lakes ports. At most they contend that the assailed rates limit their participation in such traffic. Thus, the assailed restrictions do not close the routes of interstate carriers. Secondly, the evidence of traffic availability or a "ready market" for export-import movements through these ports is at best meager. And finally, the evidence of record establishes that the assailed restrictions are published in agency tariffs which are not applicable universally. Many carriers publish rates on export-import traffic moving through the eastern Great Lakes ports which are lower than those at issue herein. In view of these facts and the lack of any evidence that the assailed rates commercially close these ports to export-import traffic, it cannot be found that the tariff restrictions constitute an unreasonable closing of interstate rail routes.

As the preceding tables indicate, the evidence relied upon by petitioners to show the present rates on export-import traffic unreasonable is very scanty. At best it shows that the assailed rates are sometimes higher than domestic rates on like traffic and movements. It also shows that these rates reflect a higher percentage of the first-class rates and produce greater car-mile earnings. However, the significance of these figures has already been discussed in this report. The value of this evidence is further diminished by petitioners' failure to show that the rates depicted are in fact representative of the commodities and rates applicable on their export-import traffic and that the compared rates are moving any traffic. In any event, petitioners' allegation and testimony to the effect that no different transportation costs are experienced or services are provided to domestic than to export-import traffic at the eastern Great Lakes ports has been rebutted by respondents' testimony and explanation that different competition exists and different services are provided on such traffic. Since petitioners have failed to establish that the compared rates apply on traffic with similar transportation conditions, they have not shown on this record that the assailed rates on export-import traffic moving to and from the eastern Great Lakes ports are unjust and unreasonable.

Section 2 issue.—Although several petitioners originally alleged that the rates applicable on export-import traffic to and from the Great Lakes ports were unjustly discriminatory, the Administrative Law Judge concluded that this position had been abandoned since no evidence was presented in support thereof. After reviewing the evidence herein, we conclude that this determination was correct. Therefore, we find that the assailed rates are not shown to be unjustly discriminatory in violation of section 2 of the act.

Section 3(1) issues.—The principal issue presented for resolution herein is whether the rail rates applicable on general commodities, whole grains and soybeans, grain products, TOFC/COFC, and FAK export-import traffic moving to and from the Great Lakes ports are shown to be unduly prejudicial of those ports and preferential to the tidewater ports. A secondary issue is the reasonableness of prescribing the petitioners' key port formula on general-commodity traffic and maximum percentage relationship on whole grain and soybeans for relief from any undue prejudice found to exist. Obviously, the necessity of determining the latter questions is dependent upon and must await our conclusions on the primary issue. For convenience, we will separately consider the lawfulness of rates applicable on whole grains and soybeans, as well as the form of relief requested thereon.

The initial decision recommended finding that the rates applicable on export-import, general commodity, TOFC/COFC, and FAK traffic moving to and from the Great Lakes ports were not shown to be unduly prejudicial to the Great Lakes ports or preferential to the tidewater ports in violation of the act. This recommendation was based upon the conclusion that petitioners had merely shown a disparity existed in the percentage relationship of rates to the docket No. 28300 first-class rates. However, it was stated that this standard of measurement only reflected distance relationships between points and did not consider other significant transportation conditions. Furthermore, while a class-rate structure can be used to determine a proper relationship among rates, it is not compulsory and other transportation and nontransportation factors may be considered in determining whether undue prejudice exists. See the *Meat* case, *supra;* and *New York Central R. Co.* v. *United States,* 207 F. Supp. 483, 490.

Following this line of reasoning the Administrative Law Judge stated the record established that many other factors, besides rail rates, account for export-import traffic moving to and from various ports. Some of these factors included ocean rates, port terminal charges, frequency of vessel sailings, transit times, and port facilities. In addition, seasonality of Great Lakes ports, and vessel size limitations at these ports were also pertinent. Yet the petitioners failed to present any evidence on these matters or on ocean rates and through rail-ocean rates via competing ports. Lacking such evidence, the higher percentages of first-class rates reflected by the rates applicable on export-import traffic moving through the Great Lakes ports were not shown to adversely affect the petitioners' opportunity to compete. Finally, it was pointed out that petitioners seek to relate rates via their ports with rates via tidewater ports, solely on a distance basis. But the compared rates via tidewater ports were assertedly established without regard for distance, as equalization of rates on long-haul traffic to and from the tidewater port ranges disregards distance. The comparison of rates on long- and short-haul traffic was also said to be improper and the petitioners' standard of measurement would overlook the large proportion of rail costs incurred in providing terminal services.

Another consideration which resulted in the conclusion that undue prejudice had not been established was the petitioners' failure to show actual competitive injury. The Administrative Law Judge stated that for a rate disparity to result in a finding of undue prejudice, competition, or injury to the complainant must be shown by evidentiary facts, not merely general declarations. Cf. *Cudahy Packing Co.* v. *Atchison, T. & S F. Ry. Co.,* 234 I.C.C. 569, 575 (1939). It was concluded that petitioners' contentions of undue prejudice were not supported by facts of record. Thus, petitioners enjoy a natural proximity to their hinterlands and lower rates in absolute terms than to the tidewater port ranges. The growth in tonnage moved through the Great Lakes ports since opening of the St. Lawrence Seaway is impressive despite the Great Lake's seasonality and belies the petitioners' contentions of injury. And again, petitioners' failure to consider and correlate other factors determing port selection was thought to weigh against a conclusion that rail rates on export-import traffic moving through the Great Lakes ports resulted in competitive injury cognizant under section 3(1) of the act.

Petitioners vigorously oppose this recommended finding. They urge that recent Commission decisions have found that the docket No. 28300 first-class rates are a proper standard for measuring the relationships among rates and for prescribing lawful rates. Thus, it is contended that the principles enunciated in the *Volker* and *Meat* cases, *supra*, are inapplicable herein and that petitioners have met their burden of establishing that disparities exist in the present rate structure.

Several petitioners also urge that the initial decision misconstrued the law by improperly placing the burden upon them to establish that the rate disparities shown in the relationships to first-class rates were not justified by different transportation conditions. Allegedly, the law requires that a defendant (respondents herein) must show the existence of such transportation conditions as would justify the disparate treatment shown to exist and thus prove that any prejudice is not undue.

On the other elements necessary to a finding of undue prejudice, petitioners maintain (a) that respondents are clearly the common source of their injury and as a group control both the allegedly prejudicial and preferential rates, and (b) that the injury resulting from these rate disparities need not be specifically shown, but can and should be inferred from the existence of competition among various ports and port ranges.

Finally, petitioners generally assert that the "other factors" relied upon in support of the conclusion that relationships among rates to the first-class scale were not probative and that competitive injury had not been shown to result from the rate structure, are not relevant to the decision in this proceeding. In summary, petitioners request that the present rate structure on export-import traffic be found unduly prejudicial to the Great Lakes ports and preferential to the tidewater ports.

While basically agreeing with the petitioners' position on this issue, the Bureau of Enforcement urges that the key port relief formula should only be partially implemented. The Bureau states that since petitioners' evidence was limited to movements to and from interior points in CFA, IFA, and WTL territories and does not establish disparities in the rates on grain products, TOFC/COFC, and FAK traffic, any prescription of relief should be circumscribed to comport with the evidence submitted. Similarly, it does not believe that the Chicago Board has justified the prescription of rates on whole grains and soybeans at a maximum of 7 percent of first-class rates. Therefore, the Bureau requests an alternative relief order on these commodities. Finally, it notes that any grant of relief should preserve existing rate groups in order to avoid future competitive problems.

In reply, the port of New York agrees with the initial decision stating that rail rates to different port ranges should not be put into a mileage straitjacket as this would deny all ports a fair opportunity to compete for foreign commerce. Finally, it asserts that petitioners' evidence does not establish that any injury results from the present rate structure and in fact shows substantial traffic growth in recent years.

The respondents reply that petitioners are attempting to obscure the fact that their evidence clearly failed to show a violation of section 3(1) of the act. Thus, it is pointed out that petitioners rely upon a presumption of injury based on the assumed existence of competition between these ports. Furthermore, port tonnage data dispute this claim of injury.

In order to clarify the issues presented herein, it is essential to understand the history and development of rates applicable on export-import traffic moving through the tidewater ports. Generally, between points east of a line drawn from Buffalo, N.Y., south through Pittsburgh, Pa., on the one hand, and North Atlantic ports, on the other hand, commodity rates applying on export-import traffic reflect mileages and are not equalized to these competing ports. Between points in CFA territory and the North Atlantic ports, rates are equalized to these ports, mileage being disregarded. Between WTL territory and North Atlantic ports, rates are equalized to and from Boston and New York, rates to Philadelphia are 2 cents under Boston and New York, and rates to Baltimore and Norfolk are 3 cents per hundred pounds under the Boston-New York rates.

The export-import rate structure to and from the North Atlantic ports is based upon the first-class rates to Baltimore. Thus, all ports in the North Atlantic range are equalized in this class-rate structure, mileage distances being disregarded except to Baltimore.

The rate adjustment applying on export-import traffic moving to and from the gulf ports is detailed in *Export and Import Rates to and from Southern Ports*, 205 I.C.C. 511 (1934). The so-called "interior" territory from and to which these export-import rates apply may be divided into two area: the SPFFC territory; and Oliphant territory. SPFFC territory includes stations served by the railroad members thereof, and consists of points on and west of a line drawn generally south from Chicago through Indianapolis to Cincinnati. Between that territory and the gulf ports, export-import rates are usually keyed to the rate applicable to and from Baltimore, subject to the domestic rate to the lowest rated gulf port as a maximum. Between this area, including SPFFC groups 1 through 48, and the gulf ports, these carriers maintain a full line of export-import class and commodity rates.

Oliphant territory consists of stations served by the eastern railroads only, on and east of the Chicago-Indianapolis-Cincinnati line, and stations west of this line in Indiana, Illinois, and southeastern Wisconsin which are within SPFFC groups 1 through 14 and are also served by southern railroads. The rates between Oliphant territory and the gulf ports are based on percentages of the Chicago-New York rates.

There is a system of export-import first-class rates to the gulf ports which is based on the first-class rate to Baltimore. In other words, the export-import first-class rates to all north Atlantic and gulf ports are keyed to the Baltimore domestic first-class rates regardless of distance.

The export-import rates to the north Atlantic ports are not equalized or port-related from points east of the Buffalo-Pittsburgh line, a distance of approximately 440 miles. In addition, the export-import rates are not equalized or port-related to the gulf ports within a distance of approximately 500 miles. For these short-haul distances, the railroads publish general-commodity rates applicable on both export-import and domestic traffic.

From the foregoing description and our prior discussion, it is clear that the petitioners are not seeking port-related or equalized rates here. If they were, the host of factors enumerated in the initial decision, such as ocean rates, terminal charges, port services, vessel schedules, et cetera, would come into direct consideration. Instead, it is our conviction that petitioners seek rates properly related to those applicable via tidewater ports, distance considered. Thus, this proceeding can correctly be referred to as a "railroad" case, rather than a "port-related" case. Although the distinction may be somewhat semantic, it is not novel. Consequently, those other factors relating to port competition such as through transportation costs are properly relevant in this proceeding when brought forth by defendants (the respondents herein) by way of justifying any rate disparaties which are shown to exist. Thus, this proceeding is a railroad case wherein primary consideration will be given to whether proper relationships, i.e., not unduly preferential or prejudicial, exist between the railroad rates to various ports and ranges. Evidence of other factors affecting transportation via these ports is relevant when introduced by respondents to show that an existing relationship between such rates is not unduly prejudicial because of differing transportation conditions. In contrast, these other factors are necessary to establish a prima facie case in a port-related or port-equalization proceeding.

In order to support a finding of violation of section 3(1), it must be shown (1) that there is a disparity is rates, (2) that the complaining party is competitively injured, either actually or potentially, (3) that the defendant carriers are the common source of both the allegedly prejudicial and preferential treatment, and (4) that the disparity in rates is not justified by transportation conditions. Compare *Big River Industries, Inc.* v. *Aberdeen & R. R. Co.*, 329 I.C.C. 539 (1967). The complainant has the burden of proving the existence of the first three elements, and the defendant has the burden of justifying the disparity under "(4)" above. Although there are cases holding that complainant also has the burden of showing that the disparity is not justified, the weight of authority and reason generally dictate that this factor should be an affirmative defense.

It is well established that a rate may be unduly prejudicial despite the fact that it is lower in absolute amount than a compared rate. See *Rich Ladder & Mfg. Co.* v. *Akron, C. & Y. Ry. Co.*, 241 I.C.C. 475, 482-83 (1940). Thus, we find no merit in the contention that since petitioners enjoy export-import rates which are lower in amount than the tidewater ports' rates, the former cannot be shown to be unduly prejudicial.

Several parties also argue that the docket No. 28300 first-class rates are not a proper standard with which to determine the existence of rate disparities. This argument is untenable. In addition to the fact, noted previously, that a lower rate may be found unduly prejudicial, a line of recent decisions by this Commission has held that the docket No. 28300 first-class rates are an acceptable standard with which to determine the existence of rate disparities. The docket No. 28300 scale primarily reflects distance, but it gives proportionate effect to terminal expenses, so that the scale progresses at a slower rate as distance increases; in other words, the rate per mile is higher for shorter distances. This is appropriate since terminal expenses make up a larger proportion of costs for short—than for long—hauls. Thus, distance may be the best measure of transportation services actually performed, other things being equal. The caveat in the preceding statement is necessary in recognition of the fact that other transportation conditions may actually supercede the consideration of distance as a primary factor in transportation ratemaking. Thus, the docket No. 28300 first-class rate standard may be inapplicable in different circumstances. Essentially, respondents urge that this is the case herein. They aver that market and carrier competition, as well as port competition, have significantly affected the establishment of export-import rate structures.

It cannot be disputed that competition among carriers and ports has been instrumental in determining the development of export-import rate structures. The history of port-related and port-equalized export-import rates is eloquent testimony to this fact. However, it is also clear that these rate structures were not created with utter disregard for distance. To the contrary, distance has always been a principal criterion. It follows that a distance scale or standard is not improper for use in determining the existence of rate disparities or for prescribing appropriate relief, if necessary. In our view, use of a distance scale is appropriate herein and it will devolve upon the respondents to show that any rate disparities shown by use of this standard are not unduly prejudicial.

However, even though comparison of the percentage relationship of rates with the docket No. 28300 first-class rates is an acceptable method of establishing the existence of rate disparities, the evidence of record must be reviewed to determine if, in fact, the widespread disparities alleged by petitioners do exist.

To establish the existence of rate disparities, the State of Illinois presented comparisons of the rate applicable on 18 commodities moving from approximately 22 interior origins to various tidewater ports and Chicago, and from Chicago or tidewater ports to approximately 14 interior destinations. These comparisons included some six commodities moving in TOFC plan II service to or from eight interior destinations. The outbound commodities included: agricultural implements, lubricating oil and grease, aircraft towing tractors, silos, bentonite clay, vending machines, lard and shortening, natural rubber, building wall board, grain dryers, tractors, pneumatic tires, roofing material, and chemicals, NOIBN in packages. In addition, TOFC plan II rate comparisons were presented for inbound fresh meats and packinghouse products; cooked, cured, or preserved meats; canned foodstuffs; and alcoholic liquors. The vast majority of these comparisons were for hypothetical movements originating or terminating in WTL territory and a few to or from points in IFA territory. Tables 8 and 9 contain extracts from some of these exhibits.

TABLE 8

Commodity and origin (1)	Port (2)	Docket No. 28300 distance (3)	Docket No. 28300 1st class rate (4)	Export/import rate and minimum weight (5)	Percentage (Col. 5 ÷ col. 4) (6)
Agricultural implements					
Davenport, Iowa	Baltimore, Md	919	638	123/40M	19.3
	do			116/100NT	18.2
	do			106/200NT	16.6
	New Orleans, La	910	638	108/80M	16.9
	do			101/100NT	15.8
	do			93/200NT	14.6
	Chicago, Ill	161	273	88/24M[1]	32.2
	do			74/30M[1]	27.1
	do			61/200NT[1]	22.3
Lubricating oil and grease					
Kansas City, Kans./Mo	New Orleans, La	869	619	67/26M	10.8
Do	Chicago, Ill	437	419	67/40M	16.0
	do			55/60M	13.1
Tractor, aircraft towing					
Libertyville, Ill	Baltimore, Md	803	600	122/100M	20.3
Do	New Orleans, La	926	648	268/40M	41.4
Do	Chicago, Ill	40	167	75/40M	44.9

Note: Rates in cents per hundred pounds at X-267-B level.
M means thousands of pounds.
NT means net tons.
[1] Rates indicated are at the Ex Parte 281-B level.

TABLE 9

Commodity and origin (1)	Destination (2)	Docket No. 28300 distance (3)	Docket No. 28300 1st class rate (4)	Export/import rate and minimum weight (5)	Percentage (Col. 5 ÷ col. 4) (6)
Vending machines					
Kansas City, Kans./Mo	Baltimore, Md	1,140	726	211/24M	29.0
Do	New Orleans, La	869	619	211/24M	34.1
Do	Chicago, Ill	437	419	229/16M	54.7
Lard and shortening					
Albert Lea, Minn	New Orleans, La	1,127	726	134/40M	18.5
Do	Chicago, Ill	356	380	129/34M	33.9
Do	do			107/40M	28.2
Fresh meats & PHP					
New Orleans, La	Denver, Colo	1,291	784	170/75M (2 trailers)	21.7
Chicago, Ill	do	1,006	678	258/35M (1 trailer)	38.1
Meats, cooked, cured					
New Orleans, La	Ottunwa, Iowa	932	648	162/25M	25.0
Chicago, Ill	do	270	336	114/24M	33.9
				105/30M	31.3

Note: M means thousands of pounds.

This petitioner alleges that the commodities surveyed in its exhibits are representative of the traffic at issue. However, these commodities and origin/destinations were apparently selected without regard to proper sampling methodology. Testimony of record indicates that TOFC shipments no longer move in plan II service to any great extent and meats or meat products would normally move from Denver, a producing area, to Chicago rather than in the reverse direction. The evidence also shows small amounts of these commodities moving between the interior points depicted and the tidewater or Great Lakes ports. In summary, it appears that the rates on these commodities moving to or from Chicago reflect significantly higher percentages of the first-class rates, than do those applicable to tidewater ports.

As previously stated, the port of Green Bay presented rate comparisons on agricultural implements, aluminum sheet, cattle hides, and soybean oil moving from three interior origins in WTL territory to Green Bay and New Orleans. This evidence shows that despite the fact that higher rates are applicable to the tidewater port, those rates reflect lower percentage of the first-class rates in each instance than do the rates applicable on movements to Green Bay. While these examples are assertedly based on random samples, no evidence was presented of these commodities moving to either the Great Lakes or tidewater ports.

The port of Duluth offered an exhibit comparing carload rates on a random selection of commodities moving between points in WTL territory, on the one hand, and, on the other, the tidewater ports and Duluth. This exhibit compared the rates and first-class percentages on 15 commodities for movements to or from 9 interior points (the majority of which were to or from Minneapolis, Minn.). Some examples of these comparisons are presented in table 10 below:

TABLE 10

Commodity and origin (1)	Destination (2)	Docket No. 28300 mileage (3)	Docket No. 28300 1st class rate (4)	Export/import rate and minimum weight (5)	Percent (Col. 5 ÷ col. 4) (6)	Car-mile earnings (7)
Agricultural implements						
Minneapolis, Minn	Duluth/Superior, Minn./Wis	151	264	92/30M	35	183
Do	------do			80/40M	30	212
Do	------do			68/50M	26	340
Do	New Orleans, La	1,210	756	237/30M	31	58
Do	------do			199/40M	26	66
Sioux City, Iowa	Duluth/Superior, Minn./Wis	407	412	142/30M	35	105
				124/40M	30	122
Do	New Orleans, La	1,146	726	237/30M	33	62
Do	------do			199/40M	27	69
Matches						
Cloquet, Minn	Duluth/Superior, Minn./Wis	27	158	56/30M	35	622
				39/50M	25	722
Do	New Orleans, La	1,331	803	269/30M	34	61
				193/50M	24	73
Clay, ball or china						
Duluth/Superior, Minn./Wis	Cloquet, Minn	27	158	32/60M	20	711
New Orleans, La	------do	1,331	803	138/60M	17	62

Note: M means thousands of pounds.

This exhibit vividly demonstrates the difficulties inherent in comparisons of car-mile earnings without considering other elements, such as the different distances involved. It also points out that comparisons based on percentages of first-class rates sometimes may be inadequate in view of the tremendous differences reflected in actual rates. However, the evidence as a whole demonstrates the existence of some disparities in the percentage relationships to first class in the export-import rates to compared ports.

Milwaukee presented rate comparisons for 11 commodities plus 4 movements of FAK plan II traffic, applicable to approximately 12 interior points. However, the rates shown on FAK plan II traffic were inapplicable and, therefore, these proffered comparisons will be disregarded. Illustrative extracts from this presentation are contained in the following table:

TABLE 11

Commodity and origin (1)	Destination (2)	Docket No. 28300 mileage (3)	Docket No. 28300 1st-class rate (4)	Export-import rate and minimum weight (5)	Percentage (Col. 5 ÷ Col. 4) (6)	Car-mile earnings (7)
Agricultural implements						
Des Moines, Iowa	New Orleans, La	1,015	678	172/40M	25.37	68
Do	Milwaukee, Wis	359	380	114/40M	30.00	1.27
Fertilizer						
Hinton, Iowa	New Orleans, La	1,142	726	1724/NT	0.12	60
(Sergeant Bluff)	Milwaukee, Wis	487	448	1034/NT	0.12	106
Cooling and air conditioning equipment						
LaCrosse, Wis	New Orleans, La	1,096	707	234/24M	33.1	51
Do	Milwaukee, Wis	196	289	101/24M	34.9	1.24

Note: M means thousands of pounds.
NT means net tons.

The most notable feature of this exhibit is the fairly close relationship of percentages of the compared rates when like minima are considered. In contrast, extreme disparities are only apparent in the rates for substantially different minimum weights.

The State of Wisconsin also presented various rate comparisons to show the rate disparities on six commodities moving from or to six interior points located in WTL and IFA territories. The rates applicable on several of these commodities moving to various tidewater and Wisconsin ports are illustrated below:

TABLE 12

Commodity and origin (1)	Destination (2)	Docket No. 28300 mileage (3)	Docket No. 28300 1st-class rates (4)	Export-import rate and minimum weight (5)	Percentage (Col. 5 ÷ Col. 4) (6)
Agricultural implements					
Cedar Rapids, Iowa	Green Bay, Wis	327	370	112/40M	30.2
				96/50M	25.9
Do	New York, N.Y	1,107	717	181/40M	25.2
Do	New Orleans, La	972	657	142/80M	21.6
Aluminum sheet					
Davenport, Iowa	Kenosha, Wis	186	283	82/50M	28.9
Do	New York, N.Y	1,041	688	170/50M	24.7
Do	New Orleans, La	910	638	133/50M	20.9
Cattle hides					
St. Joseph, Mo	Superior, Wis	560	476	130/70M	27.3
				122/90M	25.6
Do	New York, N.Y	1,298	784	155/80M	19.8
Do	New Orleans, La	921	638	134/80M	21.0
Conveyor belts					
Cedar Rapids, Iowa	Milwaukee, Wis	240	314	126/30M	40.1
Do	New York, N.Y	1,107	717	268/30M	37.4
Do	New Orleans, La	972	657	262/30M	39.9

Note: M means thousands of pounds.

In general, this exhibit shows that slightly lower percentages of the first-class rates are usually reflected by the rates applicable on movements to tidewater ports than rates to Wisconsin ports. While it is also evident that the comparisons sometimes include rates for varying minima there does not seem to be a pattern in the relationship between these minima and the percentages of first-class rates reflected.

As set out in table 5, supra, Toledo presented rate comparisons on 16 commodities moving to or from approximately 20 interior points showing that rates applicable between these points in CFA territory and the Great Lakes reflect higher percentages of the first-class rates than do comparable rates to various North Atlantic ports. In addition, Cleveland presented the same type of evidence (see table 6, *supra*) to show the rate disparities on six commodities moving between seven interior points in CFA territory and that port when compared to North Atlantic ports.

The above-described evidence, in our estimation, establishes the existence of rate disparities on the commodities illustrated when moving between the indicated interior points and the Great Lakes ports. See *Chicago Board of Trade, supra*. However, it is evident from the record herein that the commodities and origins/destinations used in these exhibits have not been shown to be representative of the entire consist of export-import traffic. The existence of disparities in the rates on grain products, TOFC/COFC, and FAK traffic has not been established. Moreover, as indicated, the proffered exhibits only reflect the existence of disparities in rates on the particular commodities moving to or from CFA, IFA, and WTL territories. The effect of these limitations in the evidence will be considered further in determining the appropriateness of prescribing the petitioners' key port formula for relief.

In order to support a finding of undue prejudice or preference it is also necessary that either actual or potential competitive injury result from existing rate disparities. The record herein is replete with argument concerning the quantum of evidence required to show competitive injury. Petitioners generally take the position that injury need not be specifically shown, but may be inferred from the existence of competition among various ports. The Bureau basically agrees with this position. On the other hand, respondents state that petitioners are merely relying upon a presumption of injury based upon an assumption of port competition for the considered export-import traffic. In essence, it is urged that the initial decision placed the burden upon petitioners to establish *actual* injury from the considered rate disparities which is contrary to law and reason.

The type and amount of proof necessary to establish the competitive injury element under section 3(1) of the act differs, depending on whether the allegation of undue prejudice is made by a shipper or a locality, such as a port. See *New York* v. *United States*, 331 U.S. 284, 307 *et seq*. (1947). It is not necessary for a port to prove that shippers have been injured as a result of rate disparities. A port's injury may be a matter of inference. In this regard the Supreme Court stated in *New York, supra*, at page 310:

> It is, of course, obvious that the causal connection between rate discrimination and territorial injury is not always susceptible of conclusive proof. The extent of that causal relation cannot in any case be shown with mathematical exactness. It is a matter of *inference from relevant data*. [Emphasis added.]

This comports with our holding in *Chicago Board of Trade, supra*. There it was found that both the complainant port and a competitive tidewater port handled significant quantities of the considered commodity. Despite the fact that there were negligible rail shipments moving to the complainant port, it was concluded that based upon the quantities of soybeans handled by each of these ports, competition was established and injury could be presumed from the existence of disparate rates to the complainant port.

The foregoing recitation makes it clear that petitioners herein are not required to establish actual injury. Rather, they need only establish by relevant data that competition between ports exists for the traffic and that the considered traffic is actually moving through the prejudiced and preferred ports in some amount. The existence of competitive injury may then be inferred from such data.

The following total tonnage statistics of export-import foreign commerce transited via the seaport of Chicago were presented by the State of Illinois.

TABLE 13

Overseas tonnage
(tons of 2,000 pounds)

Year	Imports	Exports	Total
1958	157,000	158,000	315,000
1959	394,000	754,000	1,148,000
1960	272,000	659,000	931,000

Overseas tonnage—Continued
(tons of 2,000 pounds)—Continued

Year	Imports	Exports	Total
1961	322,000	637,000	959,000
1962	343,000	912,000	1,255,000
1963	455,000	1,080,000	1,535,000
1964	688,000	1,274,000	1,962,000
1965	1,067,000	1,455,000	2,522,000
1966	1,314,000	1,856,000	3,170,000
1967	1,434,000	1,748,000	3,182,000
1968	2,176,000	2,141,000	4,317,000
1969	1,739,000	2,194,000	3,933,000
1970	1,489,000	2,404,000	3,893,000
1971	2,233,000	2,865,000	5,098,000

In addition, petitioner offered the following statistics on export-import tonnage (in short tons) handled through the gulf ports for the years 1966 through 1971:

TABLE 14

Year	Imports	Exports	Total
1966	36,604,560	67,038,297	103,642,857
1967	35,761,226	65,620,640	101,381,866
1968	38,240,045	66,123,079	104,363,124
1969	39,893,325	60,880,427	100,773,752
1970	41,542,845	74,190,925	115,733,770
1971	47,177,668	71,329,291	118,506,959

Apparently, comparisons of the foregoing statistics are intended to establish that competition exists between the port of Chicago and the gulf ports for general-commodity traffic.

This petitioner also presented evidence, based upon extracts from the 1966 Carload Waybill Study, designed to show actual carload movements of the commodities illustrated in its exhibits under export-import rates to the tidewater ports. In summary, this exhibit shows that several carload shipments of tractors (assertedly this commodity could fall within the broad heading of agricultural implements) moved from points in Illinois, Iowa, and Wisconsin to various tidewater ports. Similarly, it is stated that the commodity lubricating oil could fall within the headings lubricating and similar oils or products of petroleum refining, for which carload movements are shown from Kansas to New Orleans. The remainder of this evidence is similar in nature, and, while it tends to indicate movements of the commodities depicted in the petitioner's exhibits, it is necessary to more specifically identify and directly relate evidence of commodity movements to support a finding of undue prejudice.

The port of Green Bay presented no direct evidence that the commodities utilized in its exhibits actually moved in foreign commerce. However, the carload waybill statistics, referred to above, indicate that there were some movements of hides from Missouri to competitive gulf ports.

Duluth notes that the 1966 Carload Waybill Study would not reflect any movements of the commodities in its exhibits through the Great Lakes ports, as such shipments commonly move on domestic rates. The study was confined to movements on rates specifically designated as export-import rates which generally apply only on movements to tidewater ports. This petitioner states that it handled 1,900,000 tons of export-import traffic in 1959. This increased to approximately 2,800,000 tons in 1969, and 4,600,000 tons in 1970 and 1971. Illustrative of this, the petitioner states that its own tonnage statistics show that 566 and 563 tons of silica sand moved through Duluth in 1969 and 1970, respectively. Yet the carload waybill study shows no movements of this commodity in export-import commerce.

In addition, Duluth avers that the commodities reflected in its exhibits moved in export-import commerce. This point is exemplified by the fact that crude rubber imported through Duluth amounted to 2,172 tons in 1969, 1,505 tons in 1970, 1,429 tons in 1971, and 62 tons in 1972. Furthermore, the petitioner shows that green coffee imported through Duluth amounted to 445 tons, 489 tons, 1,233 tons, and 401 tons for the years 1969 through 1971, respectively.

The port of Milwaukee presented the following export-import tonnage statistics to show that it is in competition with other ports and ranges for export-import general commodity traffic.

320-240 O - 81 - 37

TABLE 15

15-year history of port of Milwaukee export-import tonnage (in net tons)

Year	Import	Export	Total
1957	17,455	38,978	56,433
1958	22,098	44,898	66,996
1959	42,456	135,391	177,847
1960	29,930	200,902	230,832
1961	58,611	626,752	685,363
1962	44,928	451,256	496,184
1963	42,075	411,808	453,883
1964	104,325	539,969	644,294
1965	150,888	613,524	764,412
1966	166,190	564,445	730,635
1967	174,054	406,893	580,947
1968	290,597	433,578	724,175
1969	253,593	725,827	979,420
1970	241,017	766,843	1,007,860
1971	275,420	792,819	1,068,238

This exhibit was supplemented by evidence that the export-import commodities moving through the port include steel, alcoholic beverages, grain products, grading and roadmaking machinery, agricultural implements, and bentonite clay. In short, many of the commodities utilized in its rate comparisons.

As noted previously herein, the State of Wisconsin contrasts the value of manufactured exports it produces compared with the tonnage of manufactured products exported through Wisconsin ports. Thus, it produces 2.7 percent of manufactured exports by value, but only exports 1.4 percent by tonnage. Obviously, the validity of a comparison like this is questionable because like items are not utilized.

Wisconsin also presented evidence based upon the 1966 Carload Waybill Study which purportedly shows that many shipments of agricultural implements moved from interior points in IFA and WTL territories to various tidewater ports for export. This evidence assertedly demonstrates that the commodities utilized in this petitioner's exhibits do move in export-import commerce and it is emphasized by petitioner that these exhibits were merely presented as illustrative of the rate structure at issue.

The evidence shows that export-import traffic moving through Toledo (excluding Canadian) amounted to: 1,200,000 tons in 1967; 1,500,000 tons in 1968; 1,200,000 tons in 1969; 1,100,000 tons in

1970; and 1,500,000 tons in 1971. General cargo made up approximately 43 percent of this traffic. The principal imports are said to be steel or steel products, vehicles, and general commodities. Vehicles, heavy machinery, and agricultural products make up the bulk of Toledo's exports. No direct evidence was offered to establish that export-import movements of the commodities utilized were occurring. Instead, this petitioner also relies upon the carload waybill study for confirmation of movements via competing ports.

The port of Cleveland estimates that Cleveland only handles 7.5 percent of exports and 15 percent of imports moving from and to its hinterland area. The following table contains foreign commerce statistics for the port from 1959 through 1970.

TABLE 16

(tons)

Year	General cargo	Iron and steel	Bulk commodities	Overseas total
1959	92,868	61,357	32,373	186,598
1960	92,143	58,255	56,960	207,358
1961	80,353	68,537	96,245	245,135
1962	113,031	74,049	104,895	291,975
1963	110,646	94,566	107,578	312,790
1964	88,238	139,048	87,112	314,398
1965	124,998	326,402	85,048	536,484
1966	125,808	378,430	77,545	581,783
1967	116,929	414,823	99,844	631,596
1968	133,745	826,273	68,822	1,028,840
1969	164,722	715,739	72,121	952,582
1970	124,199	582,925	51,622	758,746

Assertedly, these tonnage figures would be significantly higher for the port if properly related rail rates were made available. No evidence was introduced by the petitioner to establish that its rate exhibits reflected traffic actually moving in export-import commerce.

Finally, the port of Detroit presented a comparison of yearly export-import tonnage statistics between the tidewater ports, the Great Lakes ports, and Detroit. This exhibit assertedly shows that despite the growth in traffic experienced by the Great Lakes ports and Detroit, the latter ports are only handling a miniscule percentage of the Nation's foreign commerce. The table below summarizes this tonnage data:

TABLE 17

(tons of 2,000 pounds)

Year	Range or port	Imports	Exports	Total
1956	Tidewater	163,348,893	126,448,189	289,797,082
1956	Great Lakes	292,824	281,334	574,158
1956	Detroit	57,616	32,734	90,350
1969	Tidewater	295,647,991	168,944,254	464,592,245
1969	Great Lakes	4,874,846	6,839,294	11,714,140
1969	Detroit	1,435,414	771,469	2,206,883
1970	Tidewater	312,933,583	205,697,712	518,631,295
1970	Great Lakes	4,585,996	6,785,184	11,371,180
1970	Detroit	1,660,578	847,924	2,508,502

However, this petitioner also failed to submit any evidence of traffic movements for the commodities on which it presented rate comparisons.

Based on the above described evidence it is concluded that petitioners have established the existence of some rate disparities on the commodities shown in their exhibits. This finding must be limited to the specific commodities depicted since petitioners have not shown, nor have they made any real attempt to substantiate that these commodities are representative of all general-commodity traffic moving in the considered area. In addition, the evidence plainly fails to establish the existence of rate disparities on commodities moving between Great Lakes ports and interior points other than in CFA, IFA, and WTL territories. Thus, any finding of undue prejudice and preference in this proceeding would necessarily be limited to conform with the evidence adduced by petitioners.

Furthermore, the evidence presented by petitioners establishes that the Great Lakes ports are in competition with the tidewater ports for export-import general-commodity traffic. The tonnage statistics in evidence alone support this general conclusion. However, the commodity movement statistics presented by petitioners and the carload waybill study submitted by the Bureau, do not support the conclusion that the commodities depicted in the petitioners' exhibits are actually moving in export-import commerce to or from the Great Lakes and tidewater ports. Therefore, it cannot be concluded that petitioners are being competitively injured by the rate disparities on specific commodities shown in these exhibits. In light of the prior discussion herein regarding competitive injury, the petitioners and any future complainants are admonished that an inference of competitive injury can only be predicated upon "relevant data" which includes some evidence of traffic movements to the competing ports or a clear showing that the traffic moves only in one direction due to significant rate disparities.

The final element in petitioners' case consists of a showing that respondents are the common source of both the allegedly prejudicial and preferential rate treatment. Petitioners' note on exceptions that there is no dispute on the record concerning the respondents' common control over the rates at issue herein. In any event, it is clear that the eastern railroad respondents control the rates between many points in IFA and CFA territory and North Atlantic, as well as Great Lakes ports, Chicago, and east thereof. Similarly, SPFFC railroads control the rates between many points in IFA and WTL territories and the gulf and western Great Lakes ports. Therefore, we find that there is common control of the rates at issue.

The eastern railroad respondents presented testimony indicating that the percentage of first-class rates is not invariably higher on export-import movements to the Great Lakes ports than it is on similar movements to the North Atlantic ports. These exhibits contain examples of commodity rates applicable on export-import traffic between points in Ohio and Indiana and the Great Lakes ports which reflect lower percentages of the first-class rates than the corresponding rates to North Atlantic ports. Baltimore is the port upon which these rate comparisons are based and the nearest port in the North Atlantic range to these Midwest points.

These examples merely serve to illustrate the fact that rate disparities are prevalent in the present export-import rate structure. However, these disparities do not in and of themselves establish that the rates applicable on some commodities moving to the Great Lakes ports unduly prefer those interests and prejudice other ports.

These respondents also urge that they have published many commodity rates on export-import traffic to or from the Great Lakes ports in response to proposals filed by petitioners. It is implied that such proposals and actions are the proper remedies for petitioners, rather than complaint proceedings. While it is undoubtedly true that respondents have sometimes acted favorably on petitioners' rate proposals such action is not a complete answer to the petitioners' problems. Favorable action on rate proposals is discretionary with the respondent railroads. In addition, petitioners complain that rate relief is often dependent upon the availability of substantial traffic. Yet substantial quantities of traffic will not move to these ports absent properly related rates. In other words, properly related rates are a prerequisite for traffic movements, but respondents will not publish such rates until the traffic is moving. In these circumstances, it is obvious that petitioners cannot and should not be expected to await respondents' action. The other arguments of these respondents have been discussed previously and need not be reiterated. However, it is noted that while petitioners may not have sought railroad rate changes on the particular commodities depicted in their exhibits this would not preclude a finding of undue prejudice.

The SPFFC and WTL railroad respondents aver that numerous freight rate adjustments have been made to encourage Great Lakes export-import traffic movements. The Chicago and North Western Transportation Company (C&NW), in particular, states that it often publishes such rate adjustments by independent action. These respondents also urge that many factors, such as ocean freight rates, port charges, and handling charges, affect a shipper's port choice. It is argued that without consideration of these factors, undue prejudice cannot be found in the present rate structure. However, most of the respondents did not offer probative evidence on these factors to show that the rate disparities at issue are not unduly prejudicial.

These respondents presented considerable evidence on the marketing characteristics of some commodities utilized in petitioners' exhibits. These commodities are crude rubber, agricultural implements, and bentonite clay. With regard to crude rubber, this commodity orginates in the Far East and is consumed in great quantities in the United States. Tonnage statistics show that the bulk of this traffic is imported through tidewater ports, although the ports of Ashtabula and Milwaukee handle significant amounts of the traffic. The C&NW states that 73 percent of the crude rubber shipments it handled in 1971 were destined to Des Moines and Highland Park, Iowa, and Eau Claire, Wis. It is noted that petitioners' exhibits contained comparisons of commodity rates on crude rubber from Chicago and New Orleans to Lincoln and Omaha, Nebr., and Topeka, Kans. These comparisons showed higher rates from Chicago, a closer port. Respondents state the comparisons are of paper rates as there are no major rubber consumers at Lincoln or

Omaha. Additionally, the compared rates to Topeka are applicable for different minima. Finally, it is stated that Ashtabula is the major importing port for this commodity due to the large number of crude rubber users in the territory immediately adjacent thereto. In summary, respondents contend that the marketing practices of crude rubber shippers determine its port of importation, rather than railroad rates.

The evidence amply demonstrates the necessity for a complainant to show traffic movements in order to establish competitive injury and justify a finding of undue prejudice. Absent such evidence, this Commission might well be dealing with and prescribing paper rates, an exercise in futility. However, the fact that the majority of crude rubber users are located near and utilize the port of Ashtabula does not negate the contention that receivers at other points utilizing other ports are entitled to rates which are not unduly prejudicial. Thus, if it were established that there are receivers of crude rubber located in Illinois, Iowa, Kansas, and Wisconsin who may utilize other Great Lakes ports upon the establishment of properly related rates, a finding of undue prejudice could perhaps be justified. But the evidence of record does not establish this necessary fact.

The C&NW also testified to the market conditions attending agricultural implement shipments. This commodity is expensive, therefore speed of service, boxing and crating capabilities, and container facilities are said to determine port choice. The primary export markets are assertedly Europe, Asia, Australia, and South America, rather than market areas to which the Great Lakes ports have a geographic advantage, i.e., the United Kingdom and Northern Europe. Thus, it is contended that other factors in conjunction with the market area determine port choice.

The factors enumerated may significantly affect export movements to particular ports, and the tonnage moving to particular markets may ultimately depend upon the markets' geographic location in relation to different ports or port ranges. But the petitioners are entitled to nonprejudicial rates on such shipments regardless of whether they can effectively compete for traffic moving to all of the primary market areas so long as they are competing to some of these markets. However, the evidence of record does not establish the existence of any competitive injury to petitioners, because specific evidence of competitive export movements is absent.

The vast majority of bentonite clay produced in the United States comes from points in WTL territory. It is primarily used as a binder for molding sands and pelletizing iron ore, and as an ingredient in oil well drilling muds. Bentonite clay exports move in bulk, semiprocessed, to Chicago and Duluth where transfer facilities move it from railcars to ocean vessels. Allegedly, Chicago has the best transfer facilities available for handling this commodity on the Great Lakes and thus obtains the majority of this traffic moving through those ports. Furthermore, the present rate structure on this commodity moving through Great Lakes ports was considered in *American Colloid Co.* v. *Akron, C. & Y. R. Co.*, 321 I.C.C. 91 (1963), where it was found that total shipper cost via gulf ports was higher than through the Great Lakes ports, but the traffic moved through gulf ports because of other factors (principally favorable geographic location to users of this product). These other factors were determined to be controlling on the shipper's choice of port and any diversion of traffic from the Great Lakes ports to the gulf ports was, therefore, caused by reasons other than the level of the assailed rates. In other words, the level of the assailed rates did not result in any injury to complainant. Similarly, we conclude that any disparity in the rates applicable on export shipments of bentonite clay moving through the Great Lakes ports has not been shown to be unduly prejudicial to complainants.

In summary, it is concluded that on the basis of the evidence presented herein, the petitioners have established that some disparities exist in the export-import rates applicable on the commodities depicted in their exhibits for movements between interior points in CFA, IFA, and WTL territories, on the one hand, and, on the other, the Great Lakes ports. Furthermore, the rate disparities existing have not been shown to result in competitive injury to petitioners. Therefore, we find that the assailed rail rates on general commodities, grain products, TOFC/COFC, and FAK export-import traffic are not shown to be unduly prejudicial to the petitioners and unduly preferential of the tidewater ports.

Finally, a few comments should be made concerning the appropriateness of petitioners' key port formula for relief. As appendix A indicates, petitioners' formula contemplates issuance of a report finding that the rates applying on all general commodities, grain products, TOFC/COFC, and FAK traffic (except whole grains and soybeans) exported or imported through Great Lakes ports are unduly prejudicial to those ports and preferential of the tidewater ports and ordering the removal of such violations by the establishment of export-import rates on these commodities moving between *all* interior points (except transcontinental territory) and the Great Lakes ports which do not exceed the same percentage of the docket No. 28300 first-class rates as reflected by corresponding rates to the key tidewater ports of Baltimore, New Orleans, or Charleston. In addition, petitioners would have such rates established upon request of any interested party where a similar export-import rate is published to a tidewater port, subject to the same privileges, charges, and conditions of transportation and to the domestic rates as maxima. It is also requested that all future general rate increases on export-import traffic moving through the various ports and ranges be established on a uniform percentage basis.

Petitioners' formula would focus on the percentage relationships between export-import rates and the docket No. 28300 rates to their ports and corresponding rates to the key tidewater ports of Baltimore, Charleston, and New Orleans. Although the utilization of Baltimore and New Orleans as key ratemaking ports would be justified due to the demonstrated connection between rates to these ports and the distance/cost scale embodied in the docket No. 28300 rates, the selection of Charleston as a key port has not been supported on this record. Similarly, the use of other ports within the tidewater port ranges would not be justified because port equalization and port-related rates within and between the tidewater port ranges have generally abrogated any direct relationship between the rates to these ports and the docket No. 28300 scale. Therefore, any relief from unduly prejudicial or preferential export-import rates predicated on use of the docket No. 28300 standard should be calculated using the percentage relationship reflected by the rates applicable to the key tidewater ports of Baltimore and New Orleans.

The rate comparisons relied upon by petitioners almost exclusively depicted commodity movements between CFA, IFA, and WTL territories, on the one hand, and, on the other, the Great Lakes and tidewater ports. Petitioners made no attempt on this record to show that the exhibited rate disparities were either similar or prevalent in other territories which would be embraced within their proposed formula. It is also noted that the petitioners' formula would automatically require establishment of rates at the same level or percentage of the docket No. 28300 first-class rates reflected by rates to these key tidewater ports. However, such action would not necessarily comport with the requirements of sections 3(1) and 15(1) of the Interstate Commerce Act. As noted previously, no evidence was submitted by petitioners to show that reduced rates would be compensatory for the considered services or justifying a prescription of reduced rates. Furthermore, differences in the transportation conditions attendant to particular rates may prove that a specific rate disparity does not result in injury and undue prejudice to a port. For example, see *American Colloid Co., supra.* In these circumstances, it is clear that, if undue prejudice and preference had been established herein, prescription of the requested relief formula would not be justified.

Finally, the proposed formula for relief would require establishment of the same privileges, charges, and conditions for rail transportation of a commodity to every port and uniform percentage rate increases in the rates applicable on export-import traffic at every port. Petitioners offered no evidence in support of these requests and they will not be considered further. We find that Petitioners' request for prescription of the key port formula and other relief is not warranted by the evidence of record and, therefore, should be, and it is hereby, denied.

Whole grain and soybeans.—The Chicago Board of Trade contends that present rail rates applicable on export shipments of whole grains and soybeans moving from origins in the State of Indiana, Illinois, Iowa, and the southwest corner of Michigan to Chicago are unjust and unreasonable as well as unduly prejudicial to Chicago and preferential of the tidewater ports. It requests that respondents be required to establish lawful rates on these commodities by the prescription of rates at a level not to exceed 7 percent of the docket No. 28300 first-class rates from origins in the described area to Chicago.

The State of Wisconsin on behalf of its ports contends that the export rates applicable on (1) corn and soybeans moving from origins in Illinois, Indiana, and Iowa, and (2) wheat flour moving from origins in Kansas, to the west bank Lake Michigan ports in Wisconsin are unduly prejudicial to those ports and preferential of the North Pacific coast ports and the gulf ports, respectively. It is requested that respondents be required to remove the undue preference in these rates by the prescription of rates on relatively the same percentage level of docket No. 28300 first-class rates as is reflected by the rates to tidewater ports.

The ports of Duluth and Toledo also alleged they had experienced significant diversion of grain and soybean traffic due to the existence of unduly preferential rates on this traffic when moving to tidewater ports. Basically, Duluth contended that the export rates on corn and soybeans moving from origins in Iowa, Minnesota, and South Dakota are unduly prejudicial to the port of Duluth and preferential to the port of Portland, Toledo maintained that the rates applicable on soybean meal for export moving from points in Illinois, Indiana, and Ohio were unreasonable and prejudicial to that port and preferential of North Atlantic ports.

In his initial decision, the Administrative Law Judge recommended finding that the rail rates on export shipments of whole grains and soybeans were not shown to be unreasonable or unduly prejudicial to the Great Lakes ports or preferential to the tidewater ports. This recommendation was predicated upon the conclusion that the docket No. 28300 class rate scale was not prescribed for application on export traffic and that commodity rates on high-volume agricultural commodities are principally influenced by competitive factors, not distance. Therefore, the docket No. 28300 first-class rates were not a proper standard with which to determine the existence of rate disparities on agricultural commodities. In essence, it was concluded that because of the distinct character of agricultural commodities and the rate structures applicable thereto, a distance scale would not correctly measure any rate disparities and undue prejudice, unless the petitioners established the validity of utilizing such a scale. In addition, it was found that the ports of Duluth and Toledo had not established the existence of any significant rate disparities (even using the docket No. 28300 scale) or competitive injury resulting in violation of sections 1 or 3(1) of the act.

Only the Board of Trade and the State of Wisconsin specifically excepted to the recommended findings regarding whole grains and soybeans. These petitioners take the position that the evidence submitted establishes that the assailed rates are unreasonable and unduly prejudicial, and justifies prescription of the relief they have requested herein.

Before discussing the evidence of the board and Wisconsin, a few words should be said regarding the contentions of Duluth and Toledo. Our review of the evidence presented by the petitioners supports the conclusion that they have not established that the present rates applicable on grains and soybeans or soybean meal traffic moving from interior points to these ports are unreasonable or unduly prejudicial or preferential. Therefore, the recommended finding with regard to these commodities and ports should be, and they are hereby, affirmed and adopted as our own.

In support of its contentions the Board of Trade presented rate comparisons on these commodities moving from points in Indiana and Michigan to the North Atlantic ports of Norfolk and

best copy available

Philadelphia. It also submitted similar comparisons of the rates on these commodities moving from points in Illinois and Iowa to the ports of Houston and New Orleans on the Gulf of Mexico. Statistics on the production of grains in the considered origin areas as well as the amounts of grain handled by various ports and ranges were also presented. Table 18 contains some representative extracts from the rate comparison exhibits submitted by this petitioner.

TABLE 18

Single boxcar export rates on grain and soybeans

Origin (1)	Destination (2)	Docket No. 28300 mileage (3)	Docket No. 28300 1st-class rate (4)	Export grain rate (5)	Percentage 1st class (6)	Export soybean rate (7)	Percentage 1st class (8)
Portland, Ind	Philadelphia, Pa	649	525	41	7.8	41	7.8
Do	Chicago, Ill	203	297	26.5	8.9	46.5	15.7
Milford, Ind	Philadelphia, Pa	704	553	41	7.4	41	7.4
Do	Chicago, Ill	116	236	21.0	8.9	40.0	17.0
Gem, Ind	Philadelphia, Pa	723	561	41	7.3	41	7.3
Do	Chicago, Ill	181	283	25.5	9.0	46.5	16.4
Lafayette, Ind	Philadelphia, Pa	765	581	41	7.1	41	7.1
Do	Chicago, Ill	120	236	21.0	8.9	45.5	19.3
Sloan, Ind	Philadelphia, Pa	803	600	50.0	7.4	51.0	8.5
Do	Chicago, Ill	123	244	22.0	9.8	36.5	15.0
Schneider, Ind	Philadelphia, Pa	815	600	41	6.7	41	6.7
				Corn rates			
Centralia, Ill	New Orleans, La	657	525	43.5	8.3		
Do	Chicago, Ill	252	328	31.0	9.5		
Newton, Ill	New Orleans, La	706	553	43.5	7.9		
Do	Chicago, Ill	213	301	31.0	10.3		
Decatur, Ill	New Orleans	749	571	43.5	7.6		
Do	Chicago, Ill	167	273	26.5	9.7		
Gibson City, Ill	New Orleans	791	590	43.5	7.4		
Do	Chicago	109	230	19.0	8.3		
Peoria, Ill	New Orleans, La	820	600	43.5	7.3		
Do	Chicago, Ill	146	258	24.5	9.5		
Chatsworth, Ill	New Orleans, La	842	610	43.5	7.1		
Do	Chicago, Ill	90	215	19.0	8.8		

The petitioner noted respondents' criticism that its rate comparisons should have been based upon the port of Baltimore in the North Atlantic range, because Baltimore is the closest port in that range to Midwest points and the commodity rates between CFA territory and the North Atlantic ports are equalized at the Baltimore rate level. However, petitioner argues that most rail carriers reach Baltimore in joint-line service and, therefore, the ports displayed give a more reasonable comparison of the single-line rates applicable. This argument is specious. Petitioners contend that rates must be properly related one to another in order to avoid undue prejudice and preference, and that the best measure of such relationships is a distance scale. Yet in this instance they would disregard the fact that export-import commodity rates to the North Atlantic port range are equalized at the Baltimore rate level which is apparently the only port in that range whose rates are related to the distance from points in CFA territory. Furthermore, the petitioners reference to the differences between single- and joint-line service are not probative. Those differences, if they exist, would reflect upon a carrier's costs and division of revenue, not upon the rate level, since the record does not indicate that any difference exists in the rates for single- or joint-line service. Thus, any comparison with the rate levels at tidewater ports should ordinarily utilize Baltimore as the key port in the North Atlantic range, and New Orleans as the key port in the gulf range, as proposed in the formula for relief submitted by petitioners.

The petitioner also presented extensive statistics of the grain tonnage produced in the States of interest to it herein. Additionally, the board submitted data on the volume of grains exported via the different ports and port ranges for various years. This data is illustrated by the following table:

TABLE 19

Volume of all grains exported moving through North Atlantic, gulf, Chicago, and Toledo ports in the years 1959, 1960, 1969, 1970, and 1971 (1,000 bushels)

Year	Total export grain, Lake, gulf, and North Atlantic ports	North Atlantic ports		Port of Chicago		Gulf ports		Port of Toledo	
		Export	Percentage[1]	Export	Percentage[1]	Export	Percentage[1]	Export	Percentage[1]
1959	815,668	166,900	20.46	35,909	4.40	510,398	62.57	12,463	1.53
1960	878,899	174,310	19.83	32,224	3.78	553,356	62.96	20,197	2.30
1969	1,185,978	80,773	6.81	82,911	6.99	856,358	72.21	75,929	6.33
1970	1,565,876	99,206	6.33	85,037	5.43	1,147,141	73.26	61,263	3.91
1971	1,508,960	90,373	5.99	73,944	4.90	1,114,289	73.84	91,291	6.05

[1] Percentage of total exports through the ports.

The Board of Trade has established that large quantities of grain and soybeans are produced in the considered interior territory and transported through the port of Chicago in competition with other ports and port ranges.

The State of Wisconsin presented comparisons of the carload rates allegedly applicable to movements of corn and soybeans from four interior origins to Wisconsin ports and North Pacific coast ports. This evidence is presented in table 20, below:

TABLE 20

Origin	Destination	Minimum weight	1st-class rate	Export rate	Percentage
Des Moines, Iowa	Green Bay, Wis	110M	427	33.5	7.9
Do	Portland, Oreg	110M	1,249	67.5	5.4
Marion, Iowa	Milwaukee, Wis	110M	314	28.5	9.1
Do	Seattle, Wash	110M	1,249	67.5	5.4
Omaha, Nebr	Superior, Wis	110M	448	37.0	8.3
Do	Portland, Oreg	110M	1,186	67.5	5.7
Yonkton, S. Dak.	Milwaukee, Wis	110M	468	41.5	8.9
Do	Seattle, Wash	110M	1,186	67.5	5.7

NOTE: M means thousand pounds.

Based on the foregoing, Wisconsin urges that the present export rates on these commodities should be found unreasonable and unduly prejudicial to its ports.

In rebuttal the respondents state that the rates shown by Wisconsin in table 20 are in error and furthermore, do not depict single-car rates but rather the rates applicable per 100 pounds for a minimum weight of 475 tons when shipped in five hopper cars or substituted boxcars at 110,000 pounds each. Table 21 following contains the respondents' comparison of single-car rates applicable on corn and soybeans from the indicated origins:

TABLE 21

Origin	Destination	Minimum weight	1st-class rate	Export rate	Percentage
Des Moines, Iowa	Green Bay, Wis	110M	427	24.5	5.7
Do	Portland, Oreg. (corn)	80M	1,249	152.5	12.2
Marion, Iowa	Milwaukee, Wis	110M	314	20.0	6.4
Do	Seattle, Wash. (soybeans)	100M	1,249	145.5	11.7
Omaha, Nebr	Superior, Wis	110M	448	37.0	8.3
Do	Portland, Oreg. (corn)	110M	1,186	92.5	7.8
Yonkton, S. Dak.	Milwaukee, Wis	110M	468	40.0	8.6
Do	Seattle, Wash. (soybeans)	110M	1,186	145.5	12.3

Note: M means thousand pounds.

As demonstrated in the preceding table, the rates applicable on export corn and soybeans moving through Wisconsin ports are substantially lower in absolute terms than via competing North Pacific coast ports. In addition, these rates also reflect substantially lower percentages of the docket No. 28300 first-class rates in almost every instance. Thus, we must conclude that this petitioner has not established the existence of any disparity in the rates at issue and, therefore, the assailed rates are not shown to be unreasonable or unduly prejudicial to Wisconsin ports in violation of the act.

The Board of Trade's exhibits (illustrated in table 18) show the existence of substantial disparities in the percentage of docket No. 28300 first-class rates reflected by the rates applicable on grain, corn, and soybeans moving between interior points, on the one hand, and, on the other, Chicago and various tidewater ports. However, as noted in our previous discussion the mere existence of rate disparities does not establish unlawfulness under the Interstate Commerce Act. The record is devoid of any evidence that the rates applicable from common interior points to the tidewater ports and Chicago are comparable for the purpose of determining their reasonableness. No attempt was made by the petitioner to show that similar transportation conditions attend the rates to North Atlantic or gulf ports and the port of Chicago. Therefore, petitioner has not shown that the considered rates are unjust and unreasonable under the act.

As noted previously, the board has generally proven that disparities exist in the present rate structure applicable on grain from Illinois points to Chicago; on grain and soybeans from Iowa points to Chicago; and on corn from Illinois and Iowa points to Chicago, when compared with corresponding rates to the key gulf port of New Orleans. However, due to the fact that petitioners' comparisons with North Atlantic ports utilized more distant ports rather than the key ratemaking port of Baltimore and would thus disregard the principle underlying their contentions herein, these comparisons are invalid. However, the statistical data presented by this petitioner adequately establishes that it is in competition for grain and soybean traffic with gulf ports and supports the inference that the present disparate rate structure will cause competitive injury to the port of Chicago.

We find that the assailed rates on grain, corn, and soybeans moving from origins in Illinois, Indiana, Iowa, and Michigan to Chicago for export are not shown to be unjust and unreasonable, but are, and for the future will be, unduly prejudicial to Chicago and preferential to the gulf ports, to the extent that the rates from points in Illinois and Iowa to Chicago are higher in relation to the docket No. 28300 first-class rates to Chicago, than the corresponding rates to the port of New Orleans are with relation to first-class rates from the same origins. Existing origin groups shall be observed.

ULTIMATE FINDINGS AND CONCLUSIONS

Upon consideration of the record in this proceeding, including the initial decision of the Administrative Law Judge, the exceptions of the petitioners, respondents, and the Bureau, and the replies thereto, we find:

1. That the requested prescription of shipside rates for application on grain products exported through the Great Lakes ports subject to a 12-cent-per-100-pound waterborne charge should be, and it is hereby, denied.

2. That the requested equalization of rates at west bank Lake Michigan ports on export-import traffic moving to and from a described portion of western trunkline territory should be, and it is hereby, denied.

3.. That the rail rates applicable on general commodities, grain products, TOFC/COFC, and FAK export-import traffic moving to and from the Great Lakes ports are not shown to be unjust and unreasonable in violation of section 1 of the act.

4. That the restrictions contained in various tariffs published by or for the accounts of the eastern railroad respondents which prohibit the application of domestic rates on export-import traffic moving to and from the eastern Great Lakes ports are not shown to be unjust and unreasonable.

5. That the rail rates applicable on all export-import traffic moving to and from the Great Lakes ports are not shown to be unjustly discriminatory in violation of section 2 of the act.

6. That the rail rates applicable on all general commodities, grain products, TOFC/COFC, and FAK export-import traffic moving to and from the Great Lakes ports are not shown to be unduly prejudicial or preferential in violation of section 3(1) of the act.

7. That the requested prescription of the Great Lakes petitioners' formula for removal of undue prejudice and preference is not warranted by the evidence of record, and it is hereby, denied.

8. That the rail rates applicable on whole grains, corn, and soybeans moving in export commerce from various origins to the Great Lakes ports are not shown to be unjust and unreasonable, but are unduly prejudicial to the port of Chicago and unduly preferential of the gulf ports, to the extent that rates from origins in Illinois and Iowa to Chicago are higher in relation to first-class rates than corresponding rates to the port of New Orleans are in relation to first-class rates from the same origins.

9. Order entered requiring respondent railroads to remove the undue preference or prejudice found to exist herein.

We further find, that this decision is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969.

COMMISSIONER HARDIN did not participate.

It is ordered, That the respondents herein, to the extent that they participate in the transportation, be, and they are hereby, notified and required to cease and desist, on or before July 15, 1976, and thereafter to abstain from practicing the undue prejudice and preference found to exist.

It is further ordered, That said respondents, to the extent that they participate in the transportation, be, and they are hereby, notified and required to establish, on or before August 16, 1976, upon not less than 30 days' notice to this Commission and to the general public by filing and posting in the manner prescribed under section 6 of the Interstate Commerce Act, and thereafter to maintain and apply rates which will prevent and avoid the undue prejudice and preference found to exist.

And it is further ordered, That this order shall continue in force until the further order of the Commission.

APPENDIX A

Revised statement of position regarding relief desired by Great Lakes interests

These interests seek the entry of a report and order finding and ordering substantially as follows:

1. That the rates applying on traffic (except whole grains) exported or imported throught Great Lakes ports are and will be unreasonable in violation of section 1 of the act and unduly prejudicial to Great Lakes ports and unduly preferential of North Atlantic, South Atlantic and gulf ports in violation of section 3(1).

2. That the Great Lakes ports are entitled to the establishment of a system of export and import rates properly related, relative transportation services considered, to the export and import rates applicable to and from such competing tidewater ports.

3. That, in order to remove the aforesaid violations of the act, export and import rates applying on specific commodities and also those having TOFC, COFC, and FAK application, shall be established between Great Lakes ports and inland points in trunkline (TL), trunkline arbitrary (TLA), central freight association (CFA), Illinois freight association (IFA), southern freight association (SFA), western trunkline (WTL), and southwestern freight bureau (SWFB) territories, as defined in TL-CTR tariff No. 3, ICC No. C-188, in accordance with the following principles:

(1) Such rates shall not exceed the same percentage of the docket No. 28300 domestic first-class rate as are reflected by the export or import rates applicable on the same commodity or traffic between such interior point and key tidewater ports in the North Atlantic, South Atlantic, or gulf port ranges as set forth in subparagraphs (a), (b) and (c) below.

(a) Key ports in the tidewater port ranges shall be Baltimore, Md., in the North Atlantic range, Charleston, S.C., in the South Atlantic range, and New Orleans, La., in the gulf range.

(b) Where export or import rates are published between such inland points and only one of the above-named tidewater port ranges, the port named for that range in subparagraph (a) shall be used as the key port for determining export and import rates between such inland points and Great Lakes ports.

(c) Where export or import rates are published between such inland points and more than one of the above-named tidewater por ranges, the port of Baltimore, Md., will be used as the key port for determining export and import rates between points in TL, TLA, and CFA territories, on the one hand, and Great Lakes ports, on the other hand; and the port of New Orleans, La., will be used as the key port for determining export and import rates between points in WTL, IFA, SWFB, and SFA territories, on the one hand, and Great Lakes ports, on the other hand.

(2) Such rates shall be established on request of any interested party in any case where an export or import rate has been published having application on such commodity or traffic between such inland point and such tidewater port.

(3) Such rates shall be subject to the same minimum weights, transit privileges, free-time provisions, and demurrage charges as apply in connection with export and import rates between such inland points and such tidewater ports.

4. There shall be no restrictions against the use of domestic rates on export or import traffic; if the domestic rates produce lower total charges on the shipments in question than the export or import rates, the domestic rates shall apply as maxima.

5. Future general increases in rates shall be applied to rates on all export and import traffic upon a uniform percentage basis, without territorial or commodity exceptions. For purposes of this requirement, export and import traffic is traffic which moves in such trades, whether or not the rate on which it moves to or from the port is designated as an export or import rate.

APPENDIX B*

Summary of the evidence

THE CHICAGO REGIONAL PORT DISTRICT

The Chicago Regional Port District is a municipal corporation created by an act of the Illinois Legislature in 1951. The Port District owns approximately 2,250 acres on Lake Calumet with 8,200 feet of modern steel dockage, three transit sheds, a warehouse, a tank farm for handling all types of liquid commodities, and two grain elevators each with a capacity of 6.5 million bushels. All of these facilities are operated by private lessees.

There are several different port facilities at Chicago. The Port District owns public port facilities located at Lake Calumet Harbor. An adjacent facility leased from the Penn Central Railroad is operated by the Lake Calumet Harbor Association, and the Navy Pier is owned by the city of Chicago, leased to two terminal operators, and served by the Chicago and North Western Transportation Company. The public facilities are served by the Chicago, Rock Island and Pacific Railroad, the Illinois Central Gulf Railroad, and the Penn Central Railroad. In addition to the public facilities located on Port District land, there are several private terminal transfer facilities located on the east side of the Harbor providing a liquid bulk tank farm, warehousing, transfer docks and open storage area. Those facilities are served by the Norfolk & Western Railroad. Calumet River port facilities are not within the Chicago Regional Port District. They are owned by private organizations. Three grain elevators located on the river have a total capacity of about 30 million bushels.

The total import-export overseas commerce flowing through the entire seaport of Chicago for the years 1958 through 1971 was as follows:

SEAPORT OF CHICAGO

Overseas tonnage (tons of 2,000 pounds)

Year	Imports	Exports	Total
1958	157,000	158,000	315,000
1959	394,000	754,000	1,148,000
1960	272,000	659,000	931,000
1961	322,000	637,000	959,000
1962	343,000	912,000	1,255,000
1963	455,000	1,080,000	1,535,000
1964	688,000	1,274,000	1,962,000

---

*The summary of evidence in this appendix is excerpted from the Administrative Law Judge's initial decision. Some minor editorial changes have been made in this summary.

SEAPORT OF CHICAGO—Continued

Overseas tonnage (tons of 2,000 pounds)—Continued

Year	Imports	Exports	Total
1965	1,067,000	1,455,000	2,522,000
1966	1,314,000	1,856,000	3,170,000
1967	1,434,000	1,748,000	3,182,000
1968	2,176,000	2,141,000	4,317,000
1969	1,739,000	2,194,000	3,933,000
1970	1,489,000	2,404,000	3,893,000
1971	2,233,000	2,865,000	5,098,000

It is noted that the port of Chicago has shown a growth pattern since the opening of the St. Lawrence Seaway in 1959. Steamship services through the port are provided by 38 regular scheduled lines to 120 ports around the world. In 1970, 555 overseas vessels called at the port representing the flags of 22 nations. To reach the port of Chicago from the Atlantic Ocean, vessels must come through the St. Lawrence Seaway, thence the Great Lakes to Lake Michigan and finally through the Calumet River to the port. The normal transit time for a steamship carrying a full load to sail from Chicago to Montreal through the St. Lawrence Seaway is 5 1/2 days and an additional 6 days to reach a European port. The transit time by steamship from Chicago to Japan is about 60 days. The seaway tolls which have remained steady for several years are 40 cents per (short) ton on bulk commodities and 90 cents per (short) ton on general cargo shipments. The shipping season through the St. Lawrence Seaway is about 8 1/2 months due to weather conditions. It normally opens about April 10th and closes about December 1st each year.

Lake Calumet is the only comprehensive commercial and industrial harbor located within the seaport of Chicago, supplemented by other public and private terminal facilities. The types of cargo handled at the various terminals in Lake Calumet Harbor includes grain, liquid bulk products, steel, automobiles, and general cargo. In addition, containerized traffic has been increasing and about 30 percent of the general cargo is containerized. About one-third of all cargo moving to or from the seaport of Chicago originates from or is destined to Lake Calumet.

The grain handled at Lake Calumet Harbor consists primarily of corn, soybeans, and pellets. Very little wheat and no barley or oats are handled through the port. The grain originates in Illinois, Iowa, and parts of Indiana. In 1970 about 1 million tons of grain was exported through Lake Calumet Harbor primarily to North European destinations such as the United Kingdom, Rotterdam, and Antwerp. Only an occasional shipment moves to the Orient. Liquid bulk products consisting of grease, tallow, lard and petrochemicals come into Chicago by tank car and barge from Illinois, Iowa, Nebraska, and Minnesota. These commodities are not exported to foreign countries, rather they are consumed within a 250-mile area outside Chicago and move by rail and truck. Steel is imported from Japan, Germany, Holland, United Kingdom, and Spain. It moves by truck just outside the metropolitan area of Chicago. Automobiles from Japan come into Chicago by rail from the gulf ports. Automobiles from Germany and the United Kingdom arrive direct by steamship and are consumed in local markets. General cargo imports at the port originate in Europe, the Mediterranean countries, and the west coast of Africa.

With respect to export grain, the water cost normally from Chicago via Montreal to Liverpool, England is competitive with the direct water service from Galveston, Texas to Liverpool. It is contended, however, that the ocean rate is dependent upon the economics that prevail at the time of shipment. Mileage is no factor. If the vessels need cargo out of the Great Lakes for a full load a lower rate is quoted. However, if the grain is not needed the rate is higher. The gulf ports are said to have a more favorable ocean rate because they can load 35,000 to 40,000 tons per ship while the vessels serving Chicago are limited to 20,000-25,000 tons.

On import traffic, it is estimated that about 50 percent moves away from the port by truck but on general cargo traffic coming into the port for export at least 60 percent moves by rail and 40 percent by truck. The port of Chicago is served by 19 trunk railroads and over 100 motor carriers.

Of the combined domestic waterborne and overseas traffic amounting to 70 million tons a year, the overseas traffic amounts to about 5 percent and it has been increasing. Since the completion of the St. Lawrence Seaway, Chicago has become a seasonal deepwater world port and the most important area in the United States for the origination of export traffic is the area which is naturally tributary to the port. It is contended that in order for the port of Chicago to fairly compete for such traffic, preservation of the port's inherent advantage of location is essential. The port of Chicago is in competition with all the Great Lakes ports as well as all the Atlantic coast and Gulf ports but not with the Pacific coast ports. It has port representatives located at New York City and Brussels, Belgium, soliciting additional traffic most of which currently moves through the north Atlantic ports.

The State of Illinois submitted rate exhibits on behalf of the port of Chicago purporting to reflect the position and principles which it advocates. Numerous examples were presented to show domestic rates applicable on export-import traffic to and from Chicago are on a higher level than the corresponding export-import rates to and from the competing tidewater ports. Counsel's brief draws attention to some of the existing rate situations.

One of the examples concerns lubricating oil and grease, in packages, from Kansas City to New Orleans, for export, and the rate is 57 cents, minimum weight 40,000 pounds, which is 9.2 percent of the docket No. 28300 first-class rate of $6.19 for a distance of 869 miles.[1] To Chicago, the Illinois Central Gulf Railroad only maintains the same rate of 57 cents, 40,000 pounds, which is 13.6 percent of the first-class rate of $4.19 for a distance of 437 miles. It also has rates of 67 cents 40,000 pounds, and 55 cents at 60,000 pounds that are 16 and 13.1 percent of first class, respectively. Under the proposed formula, it is contended that the rate on lubricating oil, in packages, from Kansas City to Chicago, for export, should be 39 cents at a minimum weight of 40,000 pounds and 45 cents at a 26,000-pound minimum.

On natural rubber imported from New Orleans to Lincoln, Nebr., 1,041 miles, the rail rates are 90.5, 84, and 79 cents subject to minimum weights of 80,000, 100,000 and 140,000 pounds, respectively. Those rates are 13.1, 12.2, and 11.5 percent of first class. From Chicago, 525 miles, to Lincoln, the rate is 154 cents, minimum weight 60,000 pounds which is 35 percent of first class. Under the proposed formula, Chicago seeks rates of 61, 57, and 54 cents at minimum weights of 80,000, 100,000, and

---

[1] All rates stated in these examples, unless otherwise indicated, are in cents per hundred pounds, and are at the Ex Parte No. 267-B level.

140,000 pounds, respectively. A similar rate situation applies to Omaha from New Orleans and Chicago. A restatement of these rates by the railroad respondents shows the lowest rate from Chicago to Lincoln to be 164 cents, 30,000-pound minimum, and 85 cents on the excess over 30,000 pounds. The rates on natural rubber are equalized from the gulf ports to Des Moines, Iowa, Lincoln and Omaha, Nebr., and Topeka, Kans., regardless of distance. As pointed out in a later discussion of natural rubber, there are no major consuming plants at Lincoln or Omaha which may be one reason why Chicago has a higher rate. Since the only origin of natural rubber is the Far East, the route of movement through Chicago is unnatural coming through the Panama Canal, up the eastern seacoast, through the St. Lawrence Seaway to Chicago and then by rail to Lincoln or Omaha. Factors other than the rail rate would appear to render Chicago an inappropriate port for the importation of natural rubber destined to Lincoln or Omaha.

Another illustration refers to plan II TOFC rates on lard, shortening, edible tallow, and vegetable oil, in packages, for export, from Topeka, Kans., to gulf ports and Chicago. The export rate to New Orleans, 883 miles, is 112 cents, 40,000 pounds minimum which is 19.8 percent of first class. The lowest rate to Chicago, 502 miles, a domestic plan II TOFC rate is 129 cents, 40,000 pounds, which is 31.6 percent of first class. Chicago seeks a rate of 81 cents, minimum 40,000 pounds, under the formula. On cross-examination the Chicago witness admitted that plan II 1/2 rates, not plan II rates, are almost always used for TOFC export-import movements. No comparison was shown of plan II 1/2 TOFC rates.

Another example cited, in the brief shows TOFC plan II rates on fresh meats and packinghouse products, imported, from gulf ports and Chicago to Denver, Colo. From New Orleans to Denver, 1,291 miles, the lowest rate, a point to point commodity import rate, is 170 cents, at 75,000 pounds, which is 24.4 percent of first class. From Chicago, 1,006 miles, the lowest rate is 258 cents, at 35,000 pounds, which is 42.7 percent of first class. Chicago seeks a rate of 147 cents, at 75,000 pounds, under the formula. In a rebuttal statement of a railroad witness it was pointed out that the Chicago rate was subject to a minimum charge of $594.61 which would be less than the 170-cent rate at 75,000 pounds to the gulf ports. The cited tariff WTL 445-F, ICC A-4766 contains a minimum charge on fresh meats from Denver to Chicago of $594.61 under TOFC plan II rate from New Orleans to Denver is published on a point-to-point basis providing for not less than two trailers, ostensibly to handle a greater volume of shipments. Whereas the rate from Chicago to Denver is a general-commodity rate using docket No. 28300 rate base numbers to determine the applicable rate. The 258-cent rate, at a 35,000-pound minimum is a single trailer rate from Chicago to Denver at the Ex Parte No. 267-B level, indicating little movement of traffic. In the reverse direction, however, from Denver to Chicago there are lower TOFC point to point commodity rates applicable on export shipments, indicating more fresh meat and packinghouse products move eastbound.

BROWN COUNTY BOARD OF HARBOR COMMISSIONERS FOR PORT OF GREEN BAY, WIS

The Brown County Board of Harbor Commissioners has been duly organized under Wisconsin statutes and by subsequent resolution of the Brown County Board of Supervisors. The board has jurisdiction over Green Bay Harbor, including the port of Green Bay and all navigable waters in Brown County. Green Bay is a port on the west bank of Lake Michigan located about 200 miles north of Chicago between Milwaukee and Duluth-Superior. The port is served by the Chicago and North Western Transportation Company, the Chicago, Milwaukee, St. Paul & Pacific Railroad Company, and the Green Bay and Western Railroad Company.

The port of Green Bay is not a public facility. The facilities at the port are privately owned by port operators. The Leicht Transfer & Storage Company maintains two separate areas of facilities for general cargo. One is the North Dock which is near the mouth of the Fox River with a capacity to berth two or three oceangoing vessels alongside the dock. At that location there is extensive storage and warehouse facilities accessible to both rail and motor carrier operations. They also have the State Street operation further up the river that can berth two or three vessels at a time. This facility also has a railtruck warehouse and open storage facilities. A number of private companies maintain their own terminals which handle bulk traffic. The port has no crane facilities for handling containerized freight although it has some mobile equipment that is used for that purpose and can handle 20-foot containers. Container traffic amounts to less than two a month. Green Bay has no steamship broker or agent nor does it have a grain elevator at the port. Fifty-two foreign trade vessels called at the port in 1971.

The port handled about 2,717,000 tons of traffic in 1971, of which more than 100,000 tons were destined overseas and 85,000-90,000 tons destined to Canada. About 85 percent of its overseas tonnage consists of United States Government shipments of world relief under Public Law 480. Imports are mostly for distribution locally with some going not to exceed 50 miles of Green Bay. There is no waterborne charge published by the railroads at Green Bay.

Green Bay has shown a growth in export traffic since 1957 when its import tonnage was 71,400 and it exported almost 42,000 tons, for a total of 113,000 tons. In 1971, the latest year shown, it imported 101,600 tons and exported 79,500 tons for a total tonnage of about 181,000 tons. The principal commodities imported include wood pulp, arsenic, twine, machine parts, ceramic floor tile, crude rubber, and electric goods. The principal commodities exported include tallow, dry milk, whey powder, rolled wheat, wheat and soy blend, bulgar, wheat flour, hides, lignon pitch, and bentonite clay.

Green Bay competes for traffic with the ports of Chicago, Kenosha, Milwaukee, and Duluth-Superior but not with the eastern Great Lakes ports. It is primarily concerned with competition to and from the gulf ports and to a lesser degree with the North Atlantic ports. Green Bay considers its natural hinterland is in western trunkline territory embracing the area west of the Mississippi River extending out to Denver, Wyoming, Montana, and down about the Oklahoma-Kansas State line. While Green Bay subscribes to a freight rate structure based on a percentage of docket No. 28300 first-class rates as sought by the other Great Lakes ports, it is maintained that for Green Bay to continue as a viable port there must be an equalization of the railroad freight rates on export-import traffic to and from the west bank Lake Michigan ports of Chicago, Kenosha, Milwaukee, and Green Bay and its so-called hinterland area in western trunkline territory.

To show disparities in carload rates from points of origin in Green Bay's so-called hinterland examples are presented comparing rates on four commodities of hypothetical movement to Green Bay and to New Orleans, for export. The comparisons include agricultural implements from Cedar Rapids, Iowa, aluminum sheets from Davenport, Iowa, and hides and soybean oil from St. Joseph, Mo. New Orleans was selected as a port destination as being representative of all gulf ports. On agricultural implements shipped from Cedar Rapids to New Orleans (972 miles) the rates are 155, 147, and 117 cents per hundred pounds at minimum weights of 80,000, 100,000, and 120,000 pounds, respectively. Said rates are 23.5, 22.3, and 17.8 percent of first class. On the same commodity shipped from Cedar Rapids to Green Bay (327 miles) the rate is 99 cents,[2] minimum weight of 50,000 pounds resulting in 27.0 percent of first class. So that the Green Bay rates will be the same percent of first class as to New Orleans, it is contended the rates should be reduced to 87, 83, and 66 cents at minimums of 80,000, 100,000, and 120,000 pounds, respectively. Thus, at the 99 cent level, Green Bay claims a rate disability of 12, 16, and 33 cents, respectively. Under the reduced rates to Green Bay the car-mile earnings are shown to be greater than are produced by rates to New Orleans.

Another example shows soybean oil from St. Joseph to New Orleans (921 miles) with a rate of 67 cents minimum weight 150,000 pounds per car subject to a minimum of five cars per shipment. In effect this rate requires a minimum weight 750,000 pounds per shipment. The rate from St. Joseph to Green Bay (579 miles) is 57 cents minimum weight 150,000 pounds. Relating these rates to a percent of first class, Green Bay contends its rate of 57 cents should be reduced to 51 cents. Not shown on Green Bay's exhibit are single-car rates at minimums of 60,000 pounds per car per shipment. At the Ex Parte No. 267-B level the rate to New Orleans is 103 cents in tariff SPFFC No. 1016-0, Item 5070 series, and to Green Bay the rate is 90 cents in Tariff WTL 2000-J, Item 3740 series.

Since the rates to Green Bay are lower on a dollars-and-cents basis, there is an indication that factors other than the rail rate is determining which port will be used.

None of the selected commodities shown on Green Bay's exhibit had any movement from points of origin to any U.S. port according to the Commission's carload waybill study for 1966.

As already noted Green Bay seeks an order equalizing the export-import rail rates on general cargo traffic moving to and from the west bank Lake Michigan ports of Chicago, Milwaukee, Kenosha, and Green Bay and western trunkline territory including Montana on and west of the eastern boundary of the State of Minnesota. The port of Duluth opposes such equalization.

This equalization request seems to be based on the theory that if rate equalization prevails at the tidewater port ranges it should apply to the west bank Lake Michigan ports. The Green Bay witness offered no evidence on the cost of service to be performed by the rail carriers; no information as to the commodities that would move; no rate comparisons; no rates to be observed; and no method of determining a rate structure. Due to the large area embraced within western trunkline territory there is a considerable variance in distances from a point in southern Missouri, for example, to Green Bay as compared to Chicago. How that difference would be handled under the proposed equalization scheme is not explained along with many other unexplained matters.

PORTS OF DULUTH-SUPERIOR

The ports of Duluth, Minnesota and Superior, Wis., are located on Lake Superior divided only by St. Louis Bay and the Minnesota-Wisconsin State line. Reference herein will be made to the port of Duluth-Superior. They are served by the Chicago and North Western Transportation Company, the Chicago, Milwaukee, St. Paul and Pacific Railroad Company, the Burlington Northern, Inc., and the Soo Line Railroad.

---

[2] This 99-cent rate, minimum 50,000 pounds, is in error. The correct rate is 96 cents.

Duluth-Superior is claimed to be the second largest port in terms of tons (domestic and foreign) handled annually. These ports support the proposed formula of requiring the railroads to publish rates on export-import traffic based on a percentage of first-class rates in order to protect their geographical location to the territory adjacent thereto within 100, 200, or 250 miles of the lake ports. It is contended that the equalized import-export rate structure between interior destinations in Central, western trunkline, Southwestern, and Southern Freight Association territories, on the one hand, and Atlantic and gulf ports, on the other, is one which has developed over the years from which traffic patterns and habits of shipping have formed and are difficult to change. However, on export-import traffic between the Great Lake ports and interior points domestic rates prevailed prior to the completion of the St. Lawrence Seaway in 1959 and, with few exceptions, that traffic still moves on domestic rates. It is argued that the level of the export-import rate structures through the Atlantic and gulf ports is the prime reason that Great Lake ports are foreclosed from competing on an equal basis for export-import traffic. Moreover, it is argued that the only way to let the lake ports have the proper reflection in rates which would protect their geographical location is to place export-import rates on a mileage basis. Duluth-Superior is opposed to the equalization of rates proposed by the port of Green Bay applying between west bank Lake Michigan ports and points in western trunkline territory including Montana.

In 1959, out of a total of 31.4 million tons handled at Duluth-Superior, 1.9 million was export-import traffic. In 1969 the export-import traffic increased to about 2.8 million tons. By 1970 total tons handled through the port had grown to 42.5 million, including more than 4.6 million tons of export-import traffic. The tonnage for 1971 was about the same as for 1970 but in addition about 2,500 tons of packinghouse products were exported through the ports. About 93 percent of the export traffic consists of government relief commodities to foreign countries such as powdered milk, flour, and grain products. In 1970 general cargo, excluding grain, for export amounted to 72,000 tons and 56,000 tons were imported. Predominant movements through the port of Duluth include for export various grains and flour products. Imports include agricultural implements, autos and parts, coffee, canned goods, glass, crude rubber, steel, and twine. These commodities originated from or were destined to an area embracing points in Minnesota, North Dakota, and Wisconsin.

The witness for Duluth-Superior admits that the lowest laid-down cost to shippers determines what port is used which includes many factors such as ocean rates, rail rates and port terminal charges. While the witness had no knowledge of the ocean rates, the dockage charge was 2.5 cents a gross rated ton, minimum $50, and the wharfage charge was generally 18 cents per 100 pounds in 1972.

The Chicago and North Western Railroad, a major carrier serving Duluth-Superior, handled 57 cars of import and 634 cars of export traffic for the port in 1970 and in 1971 the railroad handled 237 cars of import and 2,802 cars of import traffic, which did not include rail export movements to Canada.

Comparison of carload rates on various commodities were selected at random on import-export traffic between points in western trunkline territory and Duluth-Superior, New Orleans, Baltimore, and Norfolk. A typical example of alleged unequal treatment accorded the gulf and Atlantic coast ports as compared with Duluth-Superior is set forth in the following illustration which compares rates on cranes, derricks, or power shovels from Minneapolis through Duluth-Superior and New Orleans:

Port	Miles (28300)	Class 100 rate	Present rate	Percent present rate is of class 100	Proposed Duluth rate
Duluth/Superior	151	264	91-24M	34	----------------
			57-50M	22	----------------
New Orleans	1,210	756	170-40M	22	58-40M
			156-80M	20	53-80M

The Duluth-Superior rates are lower on a dollars-and-cents basis but on a percentage of first-class basis they are greater. Under the proposed formula it is contended that the Duluth-Superior rates be reduced to 58 cents, minimum 40,000 pounds and 53 cents, minimum 80,000 pounds. In almost every illustration the rates in dollars and cents to Duluth-Superior are significantly less but the percentage of first-class is greater. Of the examples shown, the record reveals scant evidence of movement from the selected points of origin to the selected tidewater port. It seems clear that in view of the disparities shown in favor of the lower charges in dollars and cents to Duluth-Superior, there must be factors other than the rail rates that would cause the traffic to move through other ports.

PORT OF MILWAUKEE

The port of Milwaukee is located on the west bank of Lake Michigan about 90 miles north of Chicago. The port's facilities are located on 2.5 miles of shoreline and feature both finger piers and quay-type wharves on which are located over 300,000 square feet of covered storage space including available reefer storage. These wharves feature both truck and rail access and wide aprons to accommodate the loading and unloading of the largest vessels capable of coming through the St. Lawrence Seaway system. The port is prepared to accommodate container traffic with nine heavy-lift cranes capable of handling various weights up to 200 net tons. Railroad connections are provided with the Chicago, Milwaukee, St. Paul & Pacific Railroad Company, the Minneapolis, St. Paul & Sault Ste. Marie Railway, and the Chicago and North Western Transportation Company. Connections with the Chesapeake & Ohio Railway Company and the Grand Trunk Western System are also provided for car ferry movements.

The port of Milwaukee considers its hinterland to extend south to the southern border of Illinois, west along the southern border of Missouri and Kansas, and into Colorado as far as the Rocky Mountains, northerly into the States of Wyoming and Montana up to the Canadian border, easterly along the Canadian border to the Great Lakes area and to a line directly north of Milwaukee, Wis., on Lake Superior. This trade territory includes parts of and the whole of 12 Western States. A total of 175 major ports of call in 79 countries or possessions were reached on a direct basis by the steamship lines serving the port during the 1970 season. Milwaukee considers its competition for tonnage to be not only the other Great Lakes ports but other seaboard ports as well.

A 15-year history of the port of Milwaukee's export-import tonnage (net tons) was as follows:

Year	Import	Export	Total
1957	17,455	38,978	56,433
1958	22,098	44,898	66,996
1959	42,456	135,391	177,847
1960	29,930	200,902	230,832
1961	58,611	626,752	685,363
1962	44,928	451,256	496,184
1963	42,075	411,808	453,883
1964	104,325	539,969	644,294
1965	150,888	613,524	764,412
1966	166,190	564,445	730,635
1967	174,054	406,893	580,947
1968	290,597	433,578	724,175
1969	253,593	725,827	979,420
1970	241,017	766,843	1,007,860
1971	275,420	792,819	1,068,239

The principal commodities imported at Milwaukee include various types of steel, binder and bailer twine, and alcoholic beverages. The principal exports include grain products and dried milk under Public Law 480, grading and road making machinery, some agricultural implements, and some bentonite clay.

In 1970 the Chicago and North Western railroad handled 1,053 cars of import and 2,251 cars of export traffic at the port and in 1971 the railroad handled 2,176 cars of import and 4,171 cars of export traffic.

Except for grain, rates published to and from the port of Milwaukee are, for the most part, on the domestic basis. In contrast, many export-import tariffs are published via the North Atlantic and the gulf ports. Thus, Milwaukee contends that the full benefits of its facilities have not been attained due to the lack of proper railroad export-import rates to and from the port. Therefore, it seeks to have established an export-import rate structure applying on cargos moving to and from the port of Milwaukee by adoption of the formula submitted by the Great Lakes interests based on a percentage of docket No. 28300 first-class rates.

The Milwaukee witness submitted several examples of comparative carload rail rates from certain origins within its so-called hinterland to Milwaukee compared to New Orleans. On rates to the gulf ports there are export rates to the "A" countries and "B" countries. The "B" country rates apply to destinations in Europe, Africa, and the east coast of South America. The "A" rates apply to countries other than those just named and are generally higher. Cross-examination of the witness on his exhibits disclosed several facts which must be understood before they can have the meaning for which they were intended. The analysis of one exhibit is sufficient to show the deficiency in all examples submitted by the Milwaukee witness.

It should be borne in mind that Milwaukee subscribes to the proposed formula of export-import rates to the Great Lake ports based on a percentage of docket No. 28300 first-class rates. In the example of rates on agricultural implements from Waterloo, Iowa, to New Orleans (1,025 miles) compared to Milwaukee (274 miles) the witness shows the export-import first-class rate to New Orleans instead of the docket No. 28300 first-class rate. Moreover, the rates shown are not the present rates. By applying the present docket No. 28300 first-class rates to both Milwaukee and New Orleans and the present rates at the Ex Parte No. 281-B level the results would be as follows:

Agricultural implements from Waterloo, Iowa

To port	Inland distance docket No. 28300 miles	Docket No. 28300 first-class rate	Present inland rates and minimum weight	Percent present rates are of first-class rate
		Cents per hundredweight	*Cent per hundredweight*	
New Orleans, La	1,025	719	[1]170-40M	23.64
Milwaukee, Wis	274	356	[2]106-40M	29.77

[1] Tariff SPFFC 1016-P, I.C.C. 237, Item 7320 effective April 15, 1973:

"A" countries—170 cents, 40,000 pounds.
"B" countries—167 cents, 40,000 pounds.

[2] Tariff WTL W-200-J, I.C.C. A-4669, Item 2160-F (Supp. 101 effective June 10, 1970, Part 3).

On this present rate basis, comparing like with like, Milwaukee would contend that under the formula its rate of 106 cents should be reduced to 84 cents, 40,000 pounds, in order to have the same percentage of docket No. 28300 first-class as New Orleans. The present spread in dollars and cents is 64 cents per hundred pounds and under the proposed reduced rate the spread would be 86 cents in favor of Milwaukee. The witness notes a lower rate to Milwaukee of 87 cents, 50,000 pounds. At the Ex Parte No. 281-B level that rate became 94 cents and is presently in effect. Although the witness agrees that all factors of cost must be taken into account from a shippers standpoint which would include the rail rates, ocean rates, and port handling charges, the only factor considered in Milwaukee's exhibits is the rail rate. However, the witness offered a general opinion that ocean rates are $3 to $10 per ton greater than to and from eastern ports which converts to 15 and 50 cents per hundredweight, respectively. The seaway toll paid by the shipper or receiver from and to Milwaukee is 90 cents per ton on general cargo and 40 cents per ton on bulk commodities. The ocean transit time from Milwaukee to Europe is between 13 and 15 days. Even though the export-import rates to the gulf ports are depressed to meet barge or motor competition, the Milwaukee witness contends that his port should have the same rate relationship to docket No. 28300 first-class rates as the gulf ports.

The same witness appeared on behalf of the Traffic Committee, International Association of Great Lake ports.[1] The association's position is the same with respect to a new export-import rate structure to and from the Great Lakes ports as is urged on behalf of the port of Milwaukee.

STATE OF WISCONSIN

The State of Wisconsin engaged a firm to determine whether and to what extent rail carload rate applicable on export-import traffic are currently structured in such a manner as to disadvantage the major ports of the State, namely Green Bay, Kenosha, Milwaukee, and Superior, in their competition with other ports or groups of ports for foreign traffic. Manufactured exports originating in Wisconsin during 1969 were valued at $785.3 million. The comparable figure for the United States as a whole for 1969 was $29.2 billion. Thus, Wisconsin's share of the Nation's total was 2.7 percent. However, only 1.4 percent of the Nation's total export tonnage of manufactured products were shipped from Wisconsin ports. The witness concludes that some factor or factors are depressing Wisconsin's share of foreign trade.

---

[1] The U.S. members of the association are: Bay City, Detroit, and Monroe, Mich.; Buffalo, Ogdensburg and Oswego, New York, Chicago, Ill. (both the city of Chicago and the Chicago Regional Port Authority); Cleveland, Lorain, and Toledo, Ohio; Duluth, Minn.; Erie, Pa.; Green Bay, Milwaukee, and Superior, Wis.; and Portage, Ind.

Exhibits were submitted comparing export-import rates on representative commodities to and from the Wisconsin ports with the rates to and from Atlantic and gulf ports using the same origins or destinations. In almost all comparisons the rates are lower to the Wisconsin ports but the percentage of docket No. 28300 first-class rates are higher. Like the other Great Lakes ports, the higher percentage of first-class rates is considered to be disadvantageous to the Wisconsin ports.

A Wisconsin exhibit shows that in 1966 there were 65,100 tons of agricultural implements moving by rail from the State of Illinois for export. Forty-three thousand five hundred tons moved to the port of New York, 8,500 tons to Philadelphia-Baltimore, 2,200 tons to New Hanover County, N.C., and 10,900 tons to New Orleans. Illustrative of the alleged rate burdens imposed upon the Wisconsin ports is set forth in an exhibit of export movements of agricultural implements originating at Rockford, Ill., in the following table:

Wisconsin ports	Docket No. 28300 miles	Minimum weight	Rate in cents per hundredweight		Export rate as a percent of class 100
			Class 100	Export	
Green Bay	182	50/70M	283	75	26.5
Kenosha	84	50/70M	211	58	27.5
Milwaukee	95	50/70M	217	60	27.6
Superior	389	50/70M	399	104	26.1
Competing port					
New York	974	40M	657	135	20.5
Norfolk	997	40M	669	135	20.2
Pensacola	919	30M	638	159	24.9
Mobile	870	30M	619	159	25.7
New Orleans	923	30M	638	159	24.9
Houston	1,049	30M	688	159	23.1
Corpus Christi	1,271	30M	775	159	20.5

In each instance the rate in cents per hundred pounds is substantially less to the Wisconsin ports than to the competing ports. There is no explanation on this record why the traffic would not move through the Wisconsin ports when considered strictly from the standpoint of the rail rates. What other factors would affect the movement through the Wisconsin ports such as a difference in the ocean rates, a difference in transit time, the closing of the St. Lawrence Seaway about 4 months out of the year, or insufficient port facilities and service is unknown. The Wisconsin witness did state that the Commission must consider a broader range of issues than merely those represented by rates in existence in October 1971. He contended that it is essential before any construction of a rate formula is made, if any is necessary, it must be determined how a commodity is presently moving, the type of cars it moves in, the cost of handling, who wants to handle it and whether or not a shipper is prevented from using any particular port because of rate structure and other similar questions. Although the State of Wisconsin subscribes to the formula urged by the Great Lakes interests, the witness took the position that if Wisconsin did not prove a case for any particular formula, the Commission should make an overall finding of discrimination and proceed on a case-by-case basis.

PORT OF TOLEDO

The port of Toledo is located at the western end of Lake Erie and it is served by the Chesapeake and Ohio Railroad Company, the Baltimore and Ohio Railroad Company, the Penn Central Transportation Company, the Detroit Toledo and Ironton Railroad Company, and the Norfolk and Western Railway Company. About 75 motor common carriers serve the port and handle almost 60 percent of the export-import traffic moving through the port. In the last 10 years an average of 400 to 500 overseas vessels called at the port annually.

The port does not have a special container crane but it has a special designated area with some heavy lift gantry cranes capable of loading and unloading containers without difficulty. One full container ship offers biweekly service to Europe. Toledo, like the other Great Lakes ports, has a minimum of container service, since most of the shipments move under break-bulk rates.

The port competes for a share of foreign commerce with other Great Lakes ports ranging from Buffalo on the east to Duluth on the north and west and with the Atlantic and gulf ports. It considers its natural hinterland to include all or portions of the States of Ohio, Indiana, Michigan, and Kentucky.

The principal items of import are steel or steel products, food products, vehicles and general commodities. Principal export items consist of vehicles, heavy machinery and all types of processed and unprocessed agricultural products. The capacity of grain elevators at the port is 27 million bushels. The grain is shipped to all parts of the world but the primary movements are to Europe, the United Kingdom, and Japan. General cargo moves to Europe primarily and the secondary market is Japan. The transit time to Japan is between 22 and 25 days and to Europe or the United Kingdom 10 to 15 days.

Export-import traffic through Toledo, excluding Canadian traffic was as follows: in 1967 about 1,200,000 tons; 1968, 1,500,000 tons; 1969, 1,200,000 tons; 1970, 1,100,000 tons; and in 1971 about 1,500,000 tons. The general cargo portion increased from 405,165 tons in 1970 to 580,326 tons in 1971 or a 43.23 percent increase. According to the 1971 annual report, Toledo had its best overseas cargo year in history. General cargo and grain set all-time records. In 1971 the port handled over 60,000 import and export automobiles. A strike in October 1971 at Atlantic and gulf coast ports contributed to Toledo's good showing in 1971.

Toledo recognizes that other elements than rail rates are involved in selecting a port such as ocean rates, terminal costs, frequency of sailings, transit time, and habit considerations of political and business people. However, it is contended that only rail rates should be considered in this proceeding. Terminal charges assessed by the port of Toledo apply on dockage and wharfage. Dockage is a charge against the ship owner for use of the dock and it is 3 cents a gross registered ton for 24 hours or a fraction thereof. Wharfage is a charge against the cargo paid by the shipper or receiver which is 50 cents a ton on general cargo and 20 cents a ton on steel and automobiles. Any other charges are assessed by the private terminals that have their tariffs filed with the Federal Maritime Commission. There is a commodity terminal rate of 18 cents per hundred pounds if the commodity is classified as general cargo and 10.5 cents if the cargo is palletized. On iron and steel articles the rate ranges from 2.5 to 15 cents per hundred pounds depending on the nature of the commodity. In addition, there is a full supplement charge of $1 per freight ton and a currency adjustment of 8.5 percent based on the weight or measure factor as freighted.

The port of Toledo subscribes to the formula proposed by the Great Lakes interests. However, its position is that the effect of the gulf port's competition will be disregarded which would allow export-import rates to and from Toledo to be based solely upon the percentage relationship between the Baltimore commodity rates and the docket No. 28300 first-class rates under the formula. In the absence of export or import commodity rates to Toledo, traffic to or from Toledo moves on the docket No. 28300 class rates or specific domestic commodity rates published in individual line tariffs. It is argued that such a situation in many instances puts the cost of movement via the port of Toledo out of reach. It is contended that if the restrictions against the use of the domestic commodity rates were removed, the Great Lakes ports including Toledo would be given partial relief in meeting competition of other ports.

Rate comprisons were presented by the Toledo witness to which the respondents replied. The export rate on unmanufactured tobacco originating at Covington, Ky., to Toledo is 82 cents, minimum 40,000 pounds. To Norfolk the lowest rate is 79 cents at 48,000 pounds. All of this tobacco now moves over the Chesapeake and Ohio Railroad to Hampton Roads (Norfolk) for processing and export. There are no processing facilities on the Great Lakes so that it is improbable for tobacco to move through Toledo regardless of the rate level. On agricultural machinery from Coldwater, Ohio, to Toledo the export rate is 59 cents minimum 40,000 pounds in an individual line commodity tariff. To Baltimore the rate is 104 cents at the same minimum. The lowest rate to Baltimore is 86 cents with a 200-ton minimum giving Toledo a 27-cent rate advantage. On crude rubber between Louisville, Ky., and Toledo the rate is 87 cents minimum 30,000 pounds which is a domestic rate only. There is a rate of 122 cents, 60,000 pounds to Toledo which is applicable on both export and domestic movements. The lowest Baltimore rate applicable on export rubber from Louisville is 92 cents at 140,000 pounds. If the restriction is removed from Tariff E-2009 series the Toledo rate of 87 cents at 30,000 pounds would become applicable on export-import rubber via the port of Toledo.

CLEVELAND PORT AUTHORITY

The Cleveland Port Authority was created by simultaneous resolutions of the Cuyahoga County Commissioners and the City Council of Cleveland in April 1968. Effective January 1, 1969, the port authority assumed control of 10 city-owned general cargo piers used principally for overseas general cargo. Future plans include land acquisition and a 70-percent increase in dock space to accommodate containers and overseas bulk shipments.

The port is located on Lake Erie and is served by the Baltimore and Ohio Railroad, the Erie Lackawanna Railway, the Norfolk & Western Railway, and the Penn Central Transportation Company. Only about 5 or 10 percent of the port's export and import traffic moves by rail. The principal export commodities moving by rail are liquid latex, heavy machinery such as steel mill and dirt-moving machinery. The principal import commodities moving by rail include wire rod, plywood, and certain packaged chemicals. Export commodities by truck include lubricants, chemicals, and boxed machinery. Imports by truck would be sheet steel in coils, liqueurs, canned goods, shoes, and other consumer goods.

A witness for the port describes interior areas as hinterlands from and to which export-import traffic should reasonably be expected to move via Cleveland rather than the Atlantic or gulf coast ports. Hinterland "A" consists generally of points within 175 miles of Cleveland being located in Ohio, eastern Indiana, Kentucky, western Pennsylvania, and West Virginia. Hinterland "B" consists of the areas more than 175 miles from Cleveland but closer to Cleveland than to any Atlantic coast port. The port of Cleveland is handling about 7.5 percent of this hinterland export traffic and about 15 percent of its import traffic. This export-import traffic has been ranging between 750,000 and 1 million tons annually in recent years.

Reference is made to the rate structure between Cleveland and points in its hinterland compared with rates from the same points to and from Baltimore. Between Cleveland and "A" hinterland points the rates to and from Cleveland are class rates whereas the same points generally have relatively lower specific commodity rates, distance considered, to and from Baltimore. While the class rate to and from Cleveland is lower in dollars and cents, it is contended that the Cleveland rates are excessive and prejudicial to it because they embrace substantially less transportation than the much greater hauls to Baltimore. For example, the 28300 first-class rate on window glass from Mount Vernon, Ohio, to Baltimore (477 miles) is $4.39 per hundred pounds at the Ex Parte No. 267-B level. The applicable commodity rates are 95 cents 50,000 pounds and 81 cents 70,000 pounds or 22 and 18 percent of first-class, respectively, and car-mile earnings of $1 and $1.09. The first-class rate to Cleveland (115 miles) is $2.36. There being no commodity rate, the shipment would have to move at a class rate of 83 cents 40,000 pound minimum or 35 percent of first-class with car-mile earnings of $2.89. The rate to Cleveland based on the same percent of first-class as the rate to Baltimore, under the proposed formula, would be 52 cents at 50,000 pounds and 42 cents at 70,000 pounds.

Between "B" hinterland points and Cleveland (over 175 miles) the rates generally are class rates but from the same origins to Baltimore the railroads publish specific commodity rates which are usually lower notwithstanding the substantially shorter distance to Cleveland. For example, the witness shows the 28300 first-class rate on glass fiber rovings from Charleston, W. Va., to Baltimore (432 miles) to be $4.19 per hundredweight. The applicable commodity rates are 98 cents 40,000 pounds and 79 cents 60,000 pounds or 23 and 19 percent of first-class, respectively, with car-mile earnings of 91 cents and $1.10. The first-class rate to Cleveland (289 miles) is $3.48. Since no commodity rate is published the applicable rate is 139 cents 30,000 pounds or 40 percent of first class and the car-mile earnings would be $1.44. The rate to Cleveland based on the same percent of first class as the rate to Baltimore, under the proposed formula, would be 80 cents 40,000 pounds and 66 cents 60,000 pounds. Thus, it is noted that the applicable rate to Cleveland is greater in dollars and cents even though the distance is much less.

In summary, the Cleveland witness is stating that the rail carriers now publish export-import commodity rates from origin points in Cleveland's hinterland to the tidewater ports such as Baltimore, whereas on shipments moving from the same origins to Cleveland the rail carriers have restricted the application of said commodity tariffs on export-import traffic via Cleveland. However, on certain commodities the railroads have published a few export-import commodity rates to and from the Great Lakes ports, which include Cleveland. Furthermore, in TEA-ER commodity tariff E2009H, I.C.C. C-733, Item 83010 a domestic commodity rate is named on glass fiber rovings from Charleston, W. Va., to Cleveland which is 67 cents at 40,000 pounds compared to 98 cents at the same minimum to Baltimore. The car-mile earnings on the 67 cent rate to Cleveland would be 92 cents and on the 98-cent rate to Baltimore it would be 91 cents. Due to the restriction, above referred to in item 225 of tariff E2009H, the 67-cent rate to Cleveland is not applicable on export traffic.

PORT OF DETROIT

The port of Detroit is located in southeastern Michigan where Lake Erie connects with Lake St. Clair. The railroads serving the port include the Chesapeake and Ohio Railway Company, the Penn Central Transportation Company, the Norfolk and Western Railway Company, and the Grand Trunk Western Railroad.

The State of Michigan presented a witness on behalf of the port. To understand Michigan's position it should be pointed out that the Upper Peninsula portion of the State lies within western trunkline territory so far as freight rates are concerned while the Lower Peninsula portion is geologically and commercially tied in with northern Ohio and Indiana. The freight rate structure is not the same in both Upper and Lower Peninsulas.

Prior to the advent of the docket No. 28300 class rates and the docket No. 28310 Uniform Classification, rail rates published expressly for application to export-import traffic took precedence on foreign traffic over the domestic traffic but where there was no export-import rate, the domestic rate applied and this domestic rate application carried through the entire system of class, commodity, and exception rates.

As the rail carriers in the Official Classification District began the complex chore of weaving the old system into the new, they caused to be published an interim tariff which was to replace the old exceptions ratings and rates. This tariff, known as Trunk Line Tariff E-180, I.C.C. A-1059, became effective on June 1, 1955, and was canceled on November 25, 1968. It was a column commodity tariff subject to Uniform Freight Classification No. 2, National Rates Basis Tariff No. 1 and Ex Parte Increase Tariff No. 175. Item 224 of the original tariff read as follows:

> Rates named in this tariff will not apply on export, import, intercoastal or coastwise traffic.

The effect of the interim tariff was to preserve the rates resulting from exceptions ratings on domestic traffic but to deny application of the same rates on foreign traffic. The Great Lakes ports opposed the tariff and in Supplement 166, effective in June 1961, item 224 was revised to read:

> Rates named in this tariff will not apply on export or import traffic through North Atlantic Ports, including the Port of Albany, except will apply on traffic from and to Canada.

Trunk Line-Central Territory Class Tariff No. E-1009-A, I.C.C. C-391 became effective on September 10, 1963. Items 210 and 215 of the original tariff made all export and import class rates subject to the earlier nonuniform rates by a specific listing of the tariffs involved. Supplement 80, effective February 15, 1971, caused application of the Uniform Class Rates on export-import traffic. Item 210 was canceled and item 215 was changed to provide for application of competitive class rates to North Atlantic ports and application of standard class rates to all other ports.

For each of the original 12 docket No. 28300 class rate tariffs a companion tariff was published naming classification exceptions ratings and general column commodity rates. These 24 tariffs name the domestic class rates, classification exception ratings and rates and the general column commodity rates in all of the United States from Denver, Colo., east. All but two of those tariffs also apply on foreign traffic. The two tariffs that do not are published by the Trunk Line-Central Territory railroads.

A part of Item 225, Tariff E-2009H, I.C.C. C-733 bars application of the tariff:

On export or import traffic (except will apply between the Port of Chicago, Illinois and stations on the C & E I via the C & E I only and the Monon via the Monon only).

A part of Item 177, Tariff E/W-2010-I, I.C.C. C-737 reads:

Except as otherwise provided herein, rates or ratings in this tariff will not apply on:
Export traffic (except to points in Canada).
Import traffic (except from points in Canada).

Thus, the south Atlantic ports, Florida ports, gulf ports, west bank Lake Michigan ports from Chicago north, Lake Superior ports, and Michigan's Upper Peninsula ports on both the north and south shore have access to a complete domestic rate structure while the ports in the Lower Peninsula of Michigan and the Lake Erie ports have access to the classification and the rates made thereby as well as commodity rates published in individual line tariffs. The restriction contained in the E-2009 and E/W-2010 series tariffs against their application on export-import traffic also applies to the North Atlantic ports.

The North Atlantic ports have commodity rates published in both agency and individual line tariffs applicable on export-import traffic. The Great Lakes ports, however, are limited to commodity rates published in individual line commodity tariffs and where no individual line export-import commodity rates are published, the domestic commodity rate becomes applicable. Taking it a step further, where a domestic commodity rate is not published between an interior point and a Great Lakes port, the domestic class rate becomes the applicable rate, which of course is a higher rate.

The present rail rate structure on export-import traffic voluntarily established by the rail carriers is different when considering the west bank Lake Michigan ports with the Great Lakes ports of Chicago and those ports east thereof.

From western trunkline territory to the west bank Lake Michigan ports and portions of Illinois, Indiana, and Kentucky, an agency tariff WTL W-2000-J publishes general-commodity rates on both export-import and domestic traffic. Another agency tariff E-2009 series publishes general-commodity rates between points in official territory and trunkline territory but those rates are restricted not to apply on export-import traffic. The E/W-2010 series tariff, another agency tariff publishing general-commodity rates, applies between western trunkline territory and points in Indiana and east thereof, but restricted not to apply on export-import traffic. Although the rail carriers have published domestic commodity rates in their individual line tariffs, they do not cover all commodities that are now published in the E-2009 and E/W-2010 series tariffs.

The Michigan witness points out that the railroads do not provide any service on foreign traffic at Lower Peninsula ports that is not also provided on domestic traffic and yet a Michigan manufacturer can ship two identical carloads from the same track on the same day over the same route to the same interchange track at the same waterfront facility, and if he advises that one is for export, pay a higher charge on the export carload than he does for the domestic carload. This same situation would apply to a shipper who ships via the port of Chicago and all Great Lakes ports east thereof. Where a mixture of foreign and domestic traffic moves in and out of the same port at different rates and the nature of the traffic can be identified only by the statements made or neglected to be made by the parties, room for some manipulation is afforded.

A statement by a witness for the Detroit Marine Terminals, Inc., shows that the rail service is the same for domestic or export-import cargo at his terminal in Detroit insofar as pickup and delivery service is concerned. The statement does not relate to any differences in demurrage or detention time.

The 1970 overseas shipping season at the port of Detroit was the most successful in the 12-year history of the port. A 15-year history (1956-1970) of export-import tonnages through the coastal ports, Great Lakes ports and Detroit shows a remarkable growth. The table below shows the export-import tonnages moving through the coastal ports, the Great Lakes ports, and the port of Detroit for the years 1956, 1969, and 1970 (excluding Canada).

Year	Port	Import	Exports	Total
		In tons (2,000 pounds)		
1956	Coastal ports	163,348,893	126,448,189	289,797,082
1956	Great Lakes	292,824	281,334	574,158
1956	Detroit	57,616	32,734	90,350
1969	Coastal ports	295,647,991	168,944,254	464,592,245
1969	Great Lakes	4,874,846	6,839,294	11,714,140
1969	Detroit	1,435,414	771,469	2,206,883
1970	Coastal ports	312,933,583	205,697,712	518,631,295
1970	Great Lakes	4,585,996	6,785,184	11,371,180
1970	Detroit	1,660,578	847,924	2,508,502

While admittedly Detroit has shown an increase in tonnage since the opening of the St. Lawrence Seaway, a comparison is made as to the distribution of the increased tonnage through those ports since 1956. It is shown that the increase of all these ports was 239,631,253 tons. Of that amount of new traffic the coastal ports handled 228,834,213 tons or about 95.49 percent; the Great Lakes ports (including Detroit) handled 10,797,022 tons or about 4.51 percent; and Detroit handled 2,418,152 tons or about 1.01 percent.

In 1969 Detroit had 702 overseas vessels call at the port and 646 called in 1970. The principal commodities imported were alcoholic beverages, ferro manganese ore, fluorspar, glass products, iron and steel products, industrial machinery, crude or synthetic rubber, tractors, and general commodities. Exports included principally dried beans, building materials, chemical products, iron and steel articles, motor vehicles and parts, scrap iron and steel, tallow, and general commodities.

The State of Michigan on behalf of the Lower Peninsula ports supports the proposed formula submitted by the Great Lakes interests and it takes the position that the domestic rates should apply as maxima.

THE RESPONDENTS

The respondents in the proceeding are all of the railroads operating in the United States. With respect to the Great Lakes portion of this proceeding (Sub-No. 1B), representations for the respondents were made by: (1) the eastern railroads which serve the North Atlantic ports and the Great Lakes ports, Chicago and east; (2) the Southern Ports Foreign Freight Committee railroads which make rail rates on export-import traffic between the gulf south Atlantic ports, on the one hand, and, on the other, the interior territory on and west of the Chicago, Indianapolis, Cincinnati line; on and north of the Ohio River; and west to and including parts of Colorado and Idaho; and (3) the western trunkline railroads which publish rates through the Great Lakes ports of Chicago, Milwaukee, Kenosha, Green Bay, Superior, and Duluth.

Eastern railroads.—The Chairman of the Traffic Executive Association-Eastern Railroads presented testimony purporting to show that the percent of first-class rates is not invariably higher to the Great Lakes ports than it is to the North Atlantic ports; that the eastern railroads are not remiss in acting on rate proposals filed with them to establish competitive rates; that the railroads have published commodity rates to the Great Lakes ports; and that the Lake ports, Chicago and east, with a geographical advantage in their location to the important industrial area of the Midwest, have the additional advantage of lower rates in dollars and cents when compared with the North Atlantic ports.

The eastern rail carriers contend that the Great Lakes ports have a wide range of commodity rates contained in both agency and individual lines tariffs which are applicable on import-export traffic. An anlaysis of the tariffs in this regard shows that while there may be a few commodity rates published in the agency tariffs applicable on export-import traffic through the Great Lakes ports, a great number of point-to-point commodity rates are contained in individual line tariffs of the Baltimore and Ohio Railroad, the Norfolk and Western Railroad, and other railroads serving the Great Lakes ports. These rates are made in response to specific conditions, such as truck competition, and no attempt is made to relate them to commodity rates to or from either the Great Lakes or North Atlantic ports. However, this is not the complete answer to the Great Lakes position because while the railroads publish eastbound rates on both domestic and export traffic through the North Atlantic ports in an agency tariff Trunk Line-Central Territory C/TN 218-R, I.C.C. C-766, no tariff publishes comparable rates through the Great Lakes ports.

The eastern railroads exhibits show numerous examples of commodity rates applicable on export-import traffic moving between points in the States of Ohio and Indiana and eastern Great Lakes ports. These rates reflect lower percentages of the first-class rates than the corresponding rates to the North Atlantic ports. Baltimore is the port upon which the North Atlantic export-import rates are based and it is the nearest port to the Midwest in that port range. The eastern railroad witness offered some explanation of the few rate comparisons used by the eastern Great Lakes ports as follows:

Unmanufactured tobacco originating at Covington, Ky., moves over the Chesapeake and Ohio to Hampton Roads for processing, along with tobacco from Virginia and the Carolinas before it is exported. There are no processing facilities on the Great Lakes and therefore any movement to the Lake ports is improbable regardless of the rate level.

Agricultural machinery originating at Coldwater, Ohio, has 100- and 200-ton rates available to the North Atlantic ports and they are not published to Toledo because they have never been requested. The present rate to Toledo at the 40,000-pound level is 59 cents per 100 pounds while the most favorable rate to the east coast is 86 cents or a 27-cent-per-100-pounds advantage.

On grading and roadmaking implements from Lima, Ohio, Toledo and Baltimore are about the same percentage of first class and Toledo has a much more favorable minimum weight requirement, 60,000 pounds at 46 cents against 200,000 pounds at 116 cents.

On lead items from Muncie, Ind., to Toledo and Baltimore the rates at 36,000 pounds are 60 cents and 119 cents, respectively. Here again Toledo has the rate advantage and the percentage of first class is about the same.

In reply to the petitioners contention that the railroads should make the domestic rates effective on import-export traffic, the respondents say they overlook the difference in transportation conditions between domestic and export-import traffic. The railroads find that highway competition is much more intense on domestic than on overseas traffic which has resulted in the reduction of many domestic rates.

The eastern railroads are opposed to the opening of tariffs E-2009 and E/W 2010 to permit their use on export-import traffic via the Great Lakes or North Atlantic ports contending that it would cause the eastern carriers to suffer a drastic reduction in their revenues which they cannot afford.

With respect to class rates, the domestic rates contained in section 1 of Eastern Railroad Tariff E-1009A (class rate tariff), while not applicable on export-import traffic through the North Atlantic ports, do apply on export traffic through the Great Lakes ports. The only difference between section 1 and section 1-A rates in that tariff is the application of port equalization at North Atlantic ports from the recognized port equalization territory. Nonequalization territory includes that area within about 400 miles of the North Atlantic ports, an area equivalent to the hinterland area of the Great Lakes ports.

The following table shows the North Atlantic ports share of the Nation's export-import traffic for the years 1958 through 1971.

Year	Export	Import
	Percent	*Percent*
1958	38.4	48.4
1959	32.2	47.0
1960	32.5	46.5
1961	29.9	56.5
1962	31.0	45.2
1963	29.0	43.2
1964	28.2	40.9
1965	25.6	40.7
1966	24.7	40.6
1967	22.1	39.1
1968	19.4	36.8
1969	18.1	35.0
1970	18.9	35.8
1971	17.7	34.5

In 1958, 38.4 percent of the export tonnage and 48.4 percent of the import tonnage of the United States moved through the North Atlantic ports. With the opening of the St. Lawrence Seaway in 1959 these percentages began to decline and by 1971 they had dropped to 17.7 percent and 34.5 percent, respectively, for export and import traffic. During the same period the Great Lakes ports' share of export tonnage increased from 1.3 percent ot 4.7 percent (1958-1970) and its share of the import tonnage increased from 1.3 percent to 7.6 percent (1958-1970).

Southern Ports Foreign Freight Committee.—This committee is a railroad rate bureau, organized under section 5(a) of the Interstate Commerce Act. It deals with matters relating to export-import traffic (other than grain, coal, cotton and cottonseed products, coffee, bananas, and coconuts), from or to the interior territory consisting of the major portion of the western trunkline, Illinois Freight Association and central territories on the one hand, to or from southern ports on the other. The interior territory of the committee includes some or all of the stations in the States shown below, and Canada:

Colorado
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Michigan
Minnesota
Missouri
Montana
Nebraska
Nevada
New Mexico
New York
North Dakota
Ohio
Pennsylvania
South Dakota
Utah
West Virginia
Wisconsin
Wyoming

Approximately 20 railroads are members of the committee which include most of the major western and southern rail carriers. The formation of the committee was deemed necessary because of the difference in the export-import rate structures of the western and southern railroads and the difference in the domestic and the export-import rate situations. The purpose of the committee was to bring two major groups together in order to publish and maintain joint rates from and to the southern ports to compete with the north Atlantic ports.

Generally, the export-import rates between the interior territory, described above, and southern ports reflect the adjustment approved by the Commission in I. & S. Docket No. 3718, *Export and Import Rates to and from Southern Ports*, 205 I.C.C. 511. The rates published as a result thereof became effective May 10, 1936.

Under the I. & S. Docket No. 3718 formula, the interior territory was divided into two separate areas. The first area included all stations served by the committee member railroads and comprised points on and west of the Chicago-Indianapolis-Cincinnati line Between that territory and southern ports, export-import rates in most instances are keyed to the rates applicable at the port of Baltimore. The area is divided into groups 1 to 48 and a full line of export-import rates, i.e., class, exceptions to the class rates, and commodity rates, are published from and to the points within the area and the gulf ports, the south Florida ports, and the south Atlantic ports.[1]

The second are under the I. & S. Docket No. 3718 formula comprises stations east of the Chicago-Indianapolis-Cincinnati line served only by eastern railroads and stations west thereof in Illinois, Indiana, and the southeast corner of Wisconsin. This second area is generally referred to as the "Oliphant territory" and overlaps groups 1 to 14 of the first area. The overlapping area is served by both eastern railroads and railroads serving southern ports. Subsequent to the decision in I. & S. Docket No. 3718, the eastern railroads joined the committee's railroads using the same basis of rates from and to points in the overlapping region.

---

[1] On export-import traffic through the gulf ports the rate is 15 cents per 100 pounds less to "B" countries (Europe, Africa, and the east coast of South America) than to the "A" countries (other than Europe, Africa, and the east coast of South America).

Rates between the Oliphant territory and southern ports reflect a percentage of the Chicago-New York rate. The rates from and to this territory are equalized through south Atlantic ports and through gulf ports, Lake Charles, La., and east. Shipside rates through southern ports from and to interior points in groups 1 to 48 and west thereof are keyed to the Baltimore rate subject to the domestic rate to the lowest rated gulf or south Atlantic port as maxima. Stations in the Committee's groups 1 through 7-J are generally referred to as equalization territory since the rates to and from gulf and south Atlantic ports are usually the same at both ranges of ports.

On December 5, 1970, most of the committee's railroads converted their shipside rates to a nonshipside basis. At the same time absorption of wharfage charges was discontinued and the export-import rates were reduced by 1.5 cents per 100 pounds. Effective October 5, 1972, all member railroads of the committee took the final step in converting their single-factor shipside rates to nonshipside status. Simultaneously they discontinued the absorption of handling charges at the ports and the export-import rates at the Ex Parte No. 265 level were reduced by 9.5 cents per 100 pounds.

The following example shows the application of class 100 export rates from Chicago, a key point in the committee's groups 1 to 48, to southern ports and the relationship with the North Atlantic port of Baltimore. The class 100 export rate from Chicago to Baltimore at the Ex Parte No. 267-B level is 581 cents per 100 pounds. The Baltimore rate, however, is subject to a 12-cent-per-100-pound waterborne charge. The same rate of 581 cents is published to all gulf and South Atlantic ports applicable on traffic destined to countries other than Europe, Africa, and the east coast of South America. To Europe, Africa, and the east coast of South American the rate is 566 cents which reflects the usual differential fixed in the Todd-Knott Arbitration Wared of 1907 in favor of the gulf and South Atlantic ports. This differential at the gulf and South Atlantic ports is 15 cents under Baltimore at class 100 and grades down to 3 cents at class 13. This illustration points up the disregard for mileage while the rate of 581 cents is the same when comparing 767 miles from Chicago to Baltimore with 890 miles from Chicago to New Orleans or even 1,257 miles from Chicago to Corpus Christi, Tex.

The export-import rates which apply to or from groups 1 through 7-J are equalized through the gulf and South Atlantic ports all the way from Corpus Christi on the west to Morehead City, N.C., on the east, including Tampa, Fla., which is generally considered a south Florida port but was required by the Commission to be added to the list of gulf ports for rates to or from the committee's groups 1 through 14. See *Hillsborough County Port Authority* v. *Ahnapee & W. Ry.*, 313 I.C.C. 691 (1961). For example, Peoria, Ill., in group 7-C is 767 miles from Mobile and 1,153 miles from Tampa but the export-import rate is the same, irrespective of the 386-miles difference in distance. Thus, it is argued, that in equalizing various ranges of gulf and South Atlantic ports, the railroads have disregarded distance which is exactly the opposite of the theory advocated by the Great Lakes interests in this proceeding.

Chicago and North Western Transportation Company.—The North Western holds a unique position in that it serves all Lake Michigan west bank ports and the Duluth-Superior area. It is the only line serving those ports which does not also serve a salt-water port. Thus, it is not surprising that it has a vital interest in the continued growth of the west bank Great Lakes ports and that its policy is to continually review and survey its rate structures and to propose changes beneficial to both the ports and the railroad. In the process of encouraging two-way cargo volume through the ports it serves and attracting commerce to the St. Lawrence Seaway, the North Western has made numerous freight rate adjustments by independent action without the support of other carriers.

North Western's experience has shown that the use of a particular port for export or import depends on many factors. Some of the factors affecting the total shipper cost include the following: ocean freight rates; land transportation costs; port charges; free port; loading and unloading charges; lighterage charges; handling charges; frequency of vessel sailings; speed of vessel movement; port facilities, warehousing space; custom house brokers and foreign freight forwarders cost; choice and number of rail, truck, barge, and air service availabilities; labor climate; port free time; loss and damage experience; availability of U.S. flagships; and transit privileges.

North Western believes that its efforts are effective in the west bank port areas due to the growth of general cargo in export-import service for 1971 over 1970 moving through the ports shown in the following table.

Port	Import-carloads		Increase	Export-Carloads		Increase
	1970	1971		1970	1971	
			Percent			*Percent*
Chicago	130	148	6.5	200	695	247
Duluth-Superior	57	237	315.8	634	2,802	342
Green Bay	1	5	400	307	832	171
Milwaukee-Kenosha	1,053	2,176	106	2,251	4,171	85.3

The above table may be understated by as much as 40 percent due to the difficulty of positively identifying a shipment as export or import traffic. This is because much of the export and import traffic moves from storage or warehouses. Generally, except for grain, inland rail rates at the west bank ports do not differentiate between domestic and export-import. Only a very few export-import rates are published by the North Western to and from the Great Lakes ports.

Comparing overall export-import general cargo traffic handled by the North Western for the years 1970 and 1971, which includes Canadian and Mexican traffic, the total import traffic handled by the carrier in 1970 was 43,047 cars and 42,845 cars in 1971. On export traffic 20,535 cars were handled in 1970 increasing to 28,656 cars in 1971.

The respondents devoted considerable testimony to the marketing characteristics of certain commodities that move through the Great Lakes ports in foreign commerce to show that the rate structure to and from the Great Lakes ports is not unduly prejudicial to those ports nor unduly preferential to tidewater ports. Those commodities are discussed hereinbelow.

Crude rubber.—This commodity originates in Far East countries such as Malaysia, Singapore, Indonesia, and Thailand. The 1971 consumption of crude rubber in the United States amounted to 611,997 metric tons (1 metric ton equals 2,204.6 pounds), and it is increasing. The major U.S. ports importing crude rubber for the years 1970 and 1971 were as follows:

	1970	1971
	(Net tons)	
Tacoma, Wash	746,931	NA
New York, N.Y	212,319	NA
New Orleans, La	118,990	110,245
Baltimore, Md	72,164	NA
Norfolk, Va	12,578	25,590
Ashtabula, Ohio	46,275	100,451
Milwaukee, Wis	3,676	11,098
Chicago, Ill	992	4,023

NA - means tonnage figures not available.

The major Great Lakes port handling rubber during the navigation season is Ashtabula. Milwaukee handles the most rubber of the west bank Lake Michigan ports. Vessels handling rubber into the lakes make about five or six stops and do not handle shiploads to a single port. Often additional charges are imposed by vessel operators as they proceed westward through the lakes to each port. Ashtabula provides 30 days free time, Milwaukee 5 days and Norfolk provides practically unlimited free time.

The Chicago and North Western Railroad, which serves all the Great Lakes ports from Chicago to Duluth-Superior, handled 22 percent more carloads of rubber in 1971 than in 1970. Forty percent of its carloads originated at Milwaukee, 23 percent at Tacoma and 8 percent at New Orleans. Of those cars handled in 1971, 73 percent were terminated at Des Moines and Highland Park, Iowa, and Eau Claire, Wisconsin. During 1970, those three primary receiving points accounted for 94 percent of the total carloads of rubber handled by that railroad.

A witness for the North Western Railroad testified that a significant change has taken place in the distribution and importation of this commodity. In the past, individual rubber consumers and brokers would be responsible and handle the movements from countries of origin to final destination. However, presently, rubber is being handled not only by individual companies but also through the National Rubber Shippers Association, a subsidiary of the Rubber Manufacturers Association. Rubber moving to the United States moves on conference vessels, nonconference vessels, privately owned vessels, and through chartered vessels of the National Rubber Shippers Association which was successful in making rubber an open commodity allowing conference carriers to negotiate on an individual basis the charges for moving imported rubber. The witness states that the total cost of moving from the origin country to destination is an important factor in determining the port of rubber importation. Transfer charges at the ports are not always borne by the receivers. Other factors which are important in determining the port of import include free time car supply, port cooperation, condition of the port facilities (cleanliness), storage ability and storage charges, total transit time, inland rail rates, and port knowledge in handling crude rubber. The witness contends that rubber shippers more so than shippers of other commodities designate the port and control routing of traffic after it reaches the port. Rubber is an expensive commodity and experience in the movement and the total laid-down cost is considered important. Crude rubber cannot be left out in the open because it is a sensitive commodity. If there is any foreign matter around it is easily impregnated; if there is oil on the pier it will melt the rubber; and if it is exposed to moisture the rubber will rot.

The petitioners show commodity rates on crude rubber to be higher from Chicago to Lincoln and Omaha, Nebr., and Topeka, Kans., than from New Orleans even though the distance is over 300 miles shorter from Chicago. While the rail carriers have not published specific point-to-point rates from Chicago, nevertheless there are general-commodity rates that would apply. Since there are no major consuming rubber plants at Lincoln or Omaha, there obviously has been no request or need for specific rates. With respect to Topeka, there are specific point-to-point rates published from Chicago, Green Bay, and Milwaukee. From Chicago the rate is 82 cents, 70,000 pounds, at the Ex Parte No. 267-B level and from New Orleans the rates are 67.5, 61, and 56 cents a minimum of 80,000, 100,000, and 140,000 pounds, respectively. There is one rubber consuming plant located at Topeka.

The port of Ashtabula handles significantly more rubber tonnage than any west bank Lake Michigan port because of the proximity of that port to major user plant locations in Ohio. In the immediate tributary territory of the west bank ports—Illinois, Iowa, and Wisconsin—there are only 5 tire plants with 1 each in Nebraska and Kansas. Conversely in the State of Ohio alone there are 12 major tire plants.

In summary, it is contended, based upon the way crude rubber moves and the marketing practices surrounding such movements, the west bank Lake Michigan ports failure to attract more importation of rubber must be attributed to their longer ocean transit time and shipper preference, as well as proximity of the other ports to major consuming areas of rubber.

Agricultural implements.—Several of the Great Lakes ports have agricultural implements listed as an import-export commodity and they have shown rate comparisons from manufacturing interior origins to their port and to various tidewater ports. In almost all comparisons of record, the rates from various points to the Great Lakes ports are less than the rates applicable to North Atlantic and gulf ports. Rebuttal testimony by a Chicago and North Western Railroad witness explains the experience of his railroad regarding the movement and market circumstances of agricultural implements.

This commodity is rather an expensive one. Speed of ocean service becomes extremely important as well as consolidation of shipments, that is boxing and crating, and container facilities. The dollar volume of agricultural implements exported by the United States has declined from $323 million in 1966 to $184 million in 1970.

The following table shows the volume of agricultural machinery exported through the ports of Chicago and Milwaukee in 1970.

To	From	
	Port of Chicago	Port of Milwaukee
	Tons	
South America	44.5	158.5
Europe	3,355.5	1,345.5
Asia	149.0	75.0
Australia		.5
Africa	24.0	210.0
Total tons	3,573.0	1,789.5

Clearly the primary export market of this commodity through these ports is Europe rather than other market areas which reflects the geographical advantage these lake ports have to Northern Europe and the United Kingdom. The total export volume for 1970 of all U.S. ports was 220,011 short tons of which 50,435 tons were exported to Western Europe. The witness for the State of Illinois admitted that notwithstanding rate comparisons, the reasons for a shipper located at the Quad Cities shipping through New York or Houston at a rate which is twice as great as through Chicago is something wholly apart from the dollars-and-cents rail rate advantage in using Chicago.

The rebuttal exhibit B-100 submitted by the State of Wisconsin on behalf of the Wisconsin ports setting forth a comparison of rates with Atlantic and gulf coast ports merely confirms the rate advantage held by the Wisconsin ports.

Bentonite clay.—Bentonite clay is produced in 15 states and 25 countries of the world. In 1969, the highest year on record, 2.6 million tons of bentonite were produced in the United States. Of that total production, 74 percent came from Wyoming, Mississippi 11 percent, and Texas 4 percent.

Bentonite is a distinctive clay-like material of unique physical characteristics that has varied applications in industry. It has been called the miracle product of a thousand uses. The principal uses are as a binder for molding sands, as a binder for pelletizing taconite concentrate to form iron ore pellets, and as an ingredient of oil well drilling muds.

On the lines of the Chicago and North Western Railroad bentonite is processed at plants located at Casper and Colony, Wyo., and Belle Fourche, S. Dak. Except for limited special uses most of the bentonite clay exports move in bulk as semiprocessed material in open-top gondola cars to Great Lakes ports for transfer to either lake or ocean-type carriers. There are multiple car rates reflecting economies generated by volume movement and shippers seek ports having the lowest transfer costs from rail to water as well as minimum charter vessel rates. Chicago and Duluth are the two major ports for exporting bentonite. For example, the Chicago transfer facility has the capacity of transferring 1,000 tons per hour from railcars to vessels. No similar facility exists at other ports served by the Chicago and North Western. Of a total of 662,600 tons exported through all U.S. ports in 1971, Chicago exported 176,000 tons and Duluth 104,416 tons. Efforts by the railroad to encourage development of bulk handling facilities at Kenosha and Milwaukee, Wis., and Escanaba, Mich., have been unsuccessful.

The basis of the present rate structure to and from Great Lakes ports at the 60,000- and 100,000-pound levels is a result of the Commission's decision in *American Colloid Co. v. Akron, C. & Y. R. Co.*, 321 I.C.C. 91 (1963). In that case the Commission found that because total cost to the shipper via gulf ports was higher than at Great Lakes ports, and traffic going to the gulf ports was caused by reasons other than the level of the rates. The 60,000-pound rates in open-top cars from Belle Fourche, S. Dak., to Milwaukee, Kenosha, Green Bay, and Chicago are 97 cents and to Duluth-Superior 94 cents; at 60,000 pounds in closed cars the rate is 103 cents and 102 cents to Duluth-Superior. There is a 90-cent rate to all said ports on 100,000 pounds in open-top cars for movement via the Lakes to Montreal or points in Canada east thereof and a 49-cent rate to Chicago, 140,000-pound open car, 20-car minimum. In all instances rates to and from Great Lakes ports are equal to or less than the corresponding rates to the gulf ports.

New Orleans exports the majority of processed bentonite originating on the Chicago and North Western amounting to 366 cars in 1971 (18,300 tons). Since that movement was destined to the oil well drilling industry in South America and to pelletizing plants in Australia, which is beyond the sphere of interest of the west bank Lake Michigan ports, the selection of the port of New Orleans is not unexpected.

INTERVENERS IN SUPPORT OF THE RESPONDENTS

The Port Authority of New York and New Jersey.—The port of New York, more properly called the New York-New Jersey Port, because the port lies within both States, has been the Nation's preeminent port since the founding of our country. The Port Authority owns six major marine terminals, three on the Brooklyn waterfront, and three on the New Jersey side of the port. The newest and largest of these facilities is the Newark-Elizabeth Marine Terminal which includes the largest container port in the world. The Newark-Elizabeth Marine Terminal provides 8 miles of ship-berthing space. It was designed and constructed in order to provide adequate space and proper facilities for the transshipment of containers between sea and land carriers. In addition to Port Authority facilities, there are many private and city-owned marine terminals both existing and under construction.

The principal railroads serving the port are the Penn Central Transportation Company, Erie-Lackawanna Railroad Company, Lehigh Valley Railroad Company, The Baltimore and Ohio Railroad Company, and the Central Railroad Company of New Jersey.

As to both exports and imports, the port handles primarily general cargo amounting to about 15 million tons annually. The port handles a large volume of import petroleum but bulk grain exports have practically disappeared. Despite population increases and a vast expansion of foreign trade, the annual overseas tonnage moving through the port has remained about the same as it was 50 years ago.

The principal commodities exported are machinery, chemicals, steel products, vehicles and parts, textiles, tallow, fruits and vegetables, nonferrous metals, paper products, and drugs and cosmetics. The principal general cargo commodities imported are sugar, steel products, coffee, newsprint, lumber, liquor and wines, meat, vehicles and parts, and chemicals.

The New York-New Jersey Port opposes the Great Lakes formula of ratemaking and the port's witness points out that such a proposal is a strict mileage formula based on a percentage relationship of first class. If adopted, it is argued, the formula would of necessity have to be extended to rates applying to and from north and south Atlantic and gulf ports. The witness contends that the application of such a strict formula to the export-import rates applying to and from the Atlantic and gulf ports would destroy the present rate structure which has applied, with minor changes, for almost a century. Under the formula, the Great Lakes ports seek port related rates on short-haul traffic for hauls of 100, 200, and 250 miles from the lake ports, something which does not exist at the north Atlantic ports. The mileages between the north Atlantic ports and central territory to and from which port-related rates are provided are at least 440 miles distant from New York and Baltimore and distance is disregarded.

The port also argues that it is illogical and impractical to seek to determine whether any adjustment of export-import rail rates is reasonable or proper without an examination of the through rail-ocean rates and a comparison of such through charges via competing ports. If the ocean rates between the Great Lakes ports and foreign ports are no higher than between the U.S. coastal ports, as they may well be, then it is contended the present rail rates on export-import traffic to and from the Great Lakes gives those ports a tremendous advantage in the through rail-ocean rates and to claim reduced rail rates would merely increase their advantage. The port of New York-New

Jersey maintains that it is impossible to determine just how great the advantage is on the present record.

The amount of export-import traffic moving in TOFC/COFC rail service has become very large and important. There are no special export-import rates applying on traffic moving in TOFC/COFC service. This traffic is handled by the railroads on mileage rates which reflect the relative distances to and from individual ports. Thus, it is argued that the Great Lakes ports presently enjoy the advantage of their relatively shorter mileage on this traffic.

The Delaware River Port Authority.—The Delaware River Port Authority is a public corporate instrumentality of the Commonwealth of Pennsylvania and the State of New Jersey, created by compact between those States and approved by the Congress of the United States. It is an intervener in this proceeding primarily representing the port of Philadelphia.

The witness filed a statement which, upon objection, was stricken from the record on the grounds that its contents were merely argument. On brief, this port authority opposes the Great Lakes ports proposal for reduced rail rates in the belief that it would upset the present relationship to the detriment of other port ranges. Moreover, it is believed that reduced rates in a short-haul area to and from the Great Lakes would not materially affect their volume of traffic because of the superior service that can be offered by motor carriers over such short distances.

The Gulf Ports Association, Inc.—This association is a nonprofit organization incorporated under the laws of the State of Louisiana, whose corporate membership is comprised of port authorities and water terminal operators in all major gulf ports in the range from Bradenton (Manatee County), Fla. to Brownsville, Tex. The purposes of the association are to encourage and promote world trade from all gulf ports, standardize the rules and services of their ports, and develop the ports along sound economic lines.

In 1970 the import cargo through these gulf ports totaled 41.3 million tons and the exported cargo totaled 74.1 million tons. The port of New Orleans had the greatest tonnage, 7.5 million tons imported and 24.6 million tons exported although the port of Mobile had the most import tonnage for the year totaling 8.7 million tons.

The gulf ports are opposed to the Great Lakes proposed formula in the belief that such a rate structure would influence export-import traffic away from deepwater ports and that the competitive position and the economic welfare of the gulf ports would be seriously affected, even though such a formula would not alter the rate structure at the gulf or Atlantic coast ports. It is argued that the Great Lakes ports seek substantial changes in their export-import rail rate structure applying between the Lake ports and short-haul territory ranging from 100 to 250 miles and such a basis does not prevail at the gulf or Atlantic coast ports. Port-related rates do not exist at the southern ports within 550 to 600 miles of the ports and at New York the distance is about 440 miles.

The Houston Port Bureau, Inc.—The Houston Port Bureau intervened in behalf of the Port of Houston Authority, the Brazos River Harbor Navigation District, and the Board of Trustees of the Galveston Wharves in support of the respondents and more specifically in opposition to the Great Lakes allegations of undue preference to the gulf ports which include Galveston, Houston, and Freeport. The Bureau argues that there is an absence of evidence in the record to justify a finding that the present export-import rates to and from the gulf ports are preferential in violation of section 3(1) of the act, nor does the evidence show that the Great Lakes ports are prejudiced as a result of the export-import rate structure existing to and from the gulf, Atlantic, or Great Lakes range of ports.

The evidence presented by the Bureau's witness dealt in more detail with the port of Houston than with the ports of Freeport or Galveston. The port of Houston owns the land underlying the Houston Ship Channel within Harris County, Tex. The channel varies in width of 300 to 400 feet extending inland 25 miles from Galveston Bay to the turning basin at Houston and it is from 36 to 40 feet deep. The port also owns and operates 25 wharves with berthing capacity for 48 sea-going vessels. Over 120 steamship lines offer cargo service between Houston and world ports and over 4,000 vessels call at the port each year. Serving the port of Houston are 6 trunk line railroads, 38 motor carriers, 39 steamship agencies, 52 freight forwarders and customs brokers, 17 export packers, and 26 stevedoring companies.

The port of Houston is ranked third in the Nation in tonnage handled each year through the U.S. port facilities. The total general cargo tonnage moving through the port of Houston for the years 1966 to 1970 was as follows: 1966, 56,793,000; 1967, 58,305,000; 1968, 57,806,000; 1969, 55,962,000; and 1970, 62,445,000. The leading general cargo commodities imported are canned goods, coffee, bags/textiles, newsprint, wood products, iron and steel, machinery vehicles, and other metals. The leading commodities exported are hides, rice in bags, flour, cotton, packaged petroleum, iron and steel, metal scrap, oil well supplies, machinery vehicles, synthetic rubber, synthetic resins, carbon black, and fertilizers in bags.

While import tonnage has shown an increase over the years 1959 through 1971, some commodities for export are decreasing. For example, synthetic rubber has dropped from 130,000 tons in 1959 to 68,639 tons in 1971; carbon black exports have reduced from 169,358 tons in 1959 to 23,246 tons in 1971; other reductions include flour 274,315 tons in 1959 to 68,962 tons in 1971 and cotton 247,315 tons in 1959 to 98,699 tons in 1971. It is contended that the trend in the movement of these commodities is being diverted elsewhere, either the Great Lakes ports or through the east gulf ports that enjoy lower total shipside costs. It is also argued that the record will reflect a lower total rail-ocean transportation cost through Chicago than through Houston from and to interior points.

A comparison of total inland and ocean costs including handling and wharfage charges on a per-ton basis on bagged corn sugar from north Kansas City to North European countries through the named ports is shown in the table below.

	Houston	New Orleans	Mobile	Chicago
Docket No. 28300 distance	727	869	856	437
Rail line-haul	143	143	143	100
Handling charge	26 3/4	15	6 3/4	25
Wharfage	2 1/4	1 3/4	1 3/4	------
Total inland charges	172	159 3/4	151 1/2	125
Steamship rate	\$45.50	\$45.50	\$45.50	\$32
Seaway tools	------	------	------	90
Bunker surcharge	------	------	------	100
Currency surcharge------(percent)	------	------	------	8.5
Total steamship charges per net ton	\$40.63	\$40.63	\$40.63	\$32.86
Total inland and steamship charges per net ton	\$75.03	\$72.58	\$70.83	\$57.26

In cents per 100 pounds.

In dollars per gross ton.

In cents per net ton.

In cents per gross ton.

Considering the total rail-ocean cost, which has been converted to the cost per net ton, the table shows Chicago presently enjoys a lower cost than either Houston, New Orleans, or Mobile. Thus, with the present rate structure through the Great Lakes which the port of Houston contends places it in a noncompetitive position, it is opposed to any adjustment in freight rates that would result in a greater advantage to the Great Lakes ports.

The Georgia Ports Authority.—The Georgia Ports Authority is responsible for traffic matters which pertain to keeping the ports of Savannah and Brunswick, Ga., competitive with other ports with whom they must compete for foreign commerce.

The port of Savannah is located about 20 miles from the confluence of the Savannah River and the Atlantic Ocean and it is Georgia's largest port. It is served by the Seaboard Coast Line Railroad, Southern Railway System, Central of Georgia Railway Company, and the Savannah & Atlantic Railroad Company. It is in the south Atlantic range, competing with North Atlantic, gulf, and Great Lakes ports. Over 50 trunklines serve the port to all points in the United States and Canada. About 2,000 ships call at the port annually.

The port authority operates two deepwater terminals at Savannah, namely, the Garden City Terminal and the Ocean Terminal. The Garden City Terminal is served by the Savannah State Docks Railroad, a switching railroad owned and operated by the Georgia Ports Authority, which connects with the railroads serving Savannah providing interchange connections. These rail connections provide single-line service to points in areas such as East St. Louis, Cincinnati, Louisville, and Evansville, and two-line service to Chicago and most of the territory east thereof. The rail rates on export-import traffic are equalized from Wilmington, N.C., on the north, to Jacksonville, Fla., on the south, on shipments moving from and to groups 1 through 7-J of the Southern Ports Foreign Freight Committee territory.

The general cargo facilities at the port of Savannah consist of 19 general cargo berths, 2 tanker berths, 16 transit sheds, 6 gantry cranes, 1 mobile crane, a cold storage facility, fumigation plant, and 3,356,000 square feet of dry storage. A boxing plant is available at the Ocean Terminal used extensively for crating and boxing commodities for export. This facility is used to prepare export shipments of farm tractors and agricultural implements for shippers located in the Midwest.

Recently completed are two new facilities consisting of a multi-purpose container terminal and a bulk handling facility. Six container steamship lines presently call at the container terminal providing service between Savannah and Europe, the Mediterranean, and the Far East. The bulk handling facility handles all types of dry cargo such as ores, fertilizers, and feed supplements. It also handles bulk liquid cargos including edible oils, tallow, liquid naval stores, liquid sulphur, and fuels which move in domestic and foreign commerce.

Much of the jute backing brought into this country is imported through Savannah primarily from India and Pakistan. This commodity is used mainly in tufted carpet manufacturing, which is one of Georgia's leading industries. It is one of the commodities that provides a core of traffic around which other general cargo can be developed so that sufficient tonnage is available to attract more frequent sailings. Other basic commodities manufactured or processed in Georgia are pulp and paper, clay, and naval stores. These commodities are shipped to various parts of the world and are dependent upon frequent steamship sailings. Good steamship service at Savannah has drawn traffic moving to and from the Midwestern area. It is argued that if the present freight rate structure is adjusted in the manner proposed by the Great Lakes interests, Savannah could suffer a loss of traffic which could reduce the frequency of sailings now available, disadvantage and impair the existence of the port.

To secure a continuing flow of traffic the authority maintains trade development offices in Atlanta and Savannah, Ga., Chicago and New York; Bonn/Bad Godesberg, Germany; and Tokyo, Japan. In the fiscal year ending June 30, 1972, the ports of Savannah and Brunswick through Georgia Ports Authority facilities handled 2,514,203 tons of cargo in foreign commerce. For the same period in 1970 the tonnage amounted to 2,533,449 tons.

South Carolina State Ports Authority.—This port authority is an agency of the State of South Carolina and it owns all of the general cargo facilities located at the ports of Charleston, Georgetown, and Royal. It also operates the faciliites at the ports of Charleston and Georgetown and leases the facility at Port Royal to the Port Royal Clay Company. The ports authority also owns a grain elevator at Charleston (capacity 1,600,000 bushels) which is leased to the South Carolina Farm Bureau Marketing Association. It owns and operates two class II switching railroads at Charleston which serve its facilities and a number of private industries.

The ports of Charleston and Georgetown are located in the south Atlantic range of ports and compete with other port ranges in developing export-import traffic. Trade development offices are presently maintained at Charleston, New York, and Greenville-Spartanburg, S.C. It is posed to open offices in Chicago, Brussels, and Tokyo.

Exports in 1968, excluding commodities moving in bulk or containers, totaled 307,242 tons. Total exports from South Carolina alone in 1968 amounted to 249,796 tons or 81.31 percent of the total. This is considered short-haul traffic moving by private carriage, motor common carriers, and rail carriers under applicable domestic rates. Although the south Atlantic and gulf ports have some equalization of export-import rates, from and to Southern Ports Foreign Freight Committee territory only 5,265 tons or 1.71 percent of the total exports for 1968 originated from that territory. In 1971 exports amounted to 331,917 tons and again the majority of that traffic originated in South Carolina.

Total imports in 1968 amounted to 687,765 tons, including a heavy movement of frozen meat amounting to 62,819 tons. For 1971 the imports totaled 467,945 tons. The greater portion of the imports for both years were destined to points in South Carolina.

At the present time export-import rates are equalized to and from the south Atlantic coast ports, on the one hand, and a large portion of the Southern Port Foreign Freight Committee territory, on the other, regardless of distance. The South Carolina Ports Authority fears that if the method of establishing export-import rates, as proposed by the Great Lakes interests, should be adopted other ports would require the same adjustment which would disadvantage the south Atlantic ports. Under the present rate structure a shipper located within the equalized territory may choose a number of ports for the movement of his traffic and the rate is the same, regardless of distance.

The Virginia Port Authority.—The Virginia Port Authority intervened on behalf of the Virginia port terminals in the Hampton roads area which include Norfolk, Portsmouth, Newport News, and Chesapeake, Va.

The main thrust of this intervention is to point out that there are no port relationships to or from the Virginia ports for distances less than 300 miles which is considered short-haul traffic. General cargo moving in foreign commerce through the Virginia ports has become about 45 percent containerized traffic. In 1970, Norfolk handled about 86,000 containers and in 1971 there was an increase to 120,000. TOFC plans II 1/2 and III have the greatest demand by shippers because they have the lowest rates available. Until more recently, no export-import rates were published to and from the Virginia ports on containerized traffic and it moved on a domestic basis of rates which was mileage oriented. Since the Virginia ports are more distant from the inland origin or destination point they were competitively disadvantaged. The Chesapeake & Ohio Railroad and the Norfolk & Western Railroad have now published rates applying on plan II 1/2 TOFC traffic to and from points they serve on their lines at the same rate level applying to and from New York.

BUREAU OF ENFORCEMENT

The Bureau of Enforcement, Interstate Commerce Commission, submitted data developed from the 1966 rail carload waybill sample regarding rail export and import rated traffic. The data shows traffic, revenue, and cost characteristics of rail carload shipments moving on export-import rates in 1966 by origin State and county and destination State and county for all commodity movements involving 10 or more carloads. The data have been developed from waybills which have been identified by railroads as covering rail traffic moving from and to the ports on import and export rates. If a car moved on a domestic rate and was exported it would not show up in the study. The study serves to illustrate types of movement, patterns of flow, and the traffic and revenue characteristics of export-import rated shipments in 1966.

The cost data included in the tables were developed from the cost factors used in the Commission's 1966 burden study. The costs shown are variable costs. Two thousand seven hundred and eighty-nine carloads in the sample, or slightly more than 1 percent of total rail traffic, moved on import rates in 1966.

The Bureau also introduced a document titled *Domestic and International Transportation of U.S. Foreign Trade: 1970*, containing data on general cargo traffic moving through ports within the 48 contiguous States. The sample was made from the list of import and export shipments compiled by the U.S. Census Bureau. This list is based on copies of import and export documents filed with the U.S. Customs Office.

WHOLE GRAIN AND SOYBEANS

Evidence was presented with respect to whole grain and soybeans for export on behalf of the port of Chicago, the Wisconsin Lake Michigan ports, and the port of Duluth. The areas from which relief is sought by these ports are as follows: Chicago seeks relief on grain and soybeans from origins in Illinois, Indiana, Iowa, and the southwest corner of Michigan; Wisconsin is primarily interested in rate relief on corn and soybeans from origins in Iowa, Nebraska, and South Dakota; and Duluth seeks relief on corn and soybean rates from origins in Iowa, Minnesota, and South Dakota, and on wheat from origins in North Dakota and Montana.

EVIDENCE OF THE BOARD OF TRADE OF THE CITY OF CHICAGO

The Board of Trade presented the evidence on behalf of the port of Chicago. The board maintains a commodity exchange where its members meet daily for the purpose of buying and selling grain and grain products. Among its members are terminal storage operators, grain merchandisers, cash grain merchants, processors, millers, and exporters who operate and maintain facilities at Chicago and who ship and receive grain and grain products in interstate and foreign commerce.

Chicago has eight deepwater grain elevators with a total capacity of 59,600,000 bushels. These facilities are equipped to load and unload deep-draft vessels, inland waterways barges, railcars, and motor trucks. Total receipts of all grains at Chicago in 1971, including wheat, corn, oats, rye, barley, and soybeans, amounted to 167,349,000 bushels.

The mode of movement was as follows:

	Bushels
Lake and Seaway	606,000
Waterways	14,772,000
Rail	72,823,000
Motor carrier	79,148,000

Appendix C [omitted] hereto shows exports of all grains through North Atlantic, gulf, Chicago, and Toledo ports for the years 1959, 1960, 1969, 1970, and 1971.

The table shows that Chicago and Toledo both have export tonnages of grain approximately equal to the total tonnage through all North Atlantic ports with the greatest amount being exported through the gulf. The decline of the grain traffic to the east coast has resulted in the closing of elevator facilities at Portland, Boston, Mass., and New York. All of the remaining elevators are privately owned. The growth of the Great Lakes ports has increased from 138 million bushels in 1959 to 304 million bushels in 1971.

With the opening of the St. Lawrence Seaway in 1959, the eastern rail carriers, whose tracks parallel the waterway, proceeded to publish reduced export rates on grain, including soybeans, from origins in Illinois, Indiana, Ohio, and Michigan to the North Atlantic ports. For example, single-car rates on corn from central Illinois were reduced from 50 to 37 cents and soybeans from 72 to 38 cents. Reductions in Indiana ranged from 11 to 13.5 cents on corn and from 20.5 to 30.5 cents on soybeans. Multiple-car rates were also published by the eastern carriers to the North Atlantic ports. To satisfy a complaint filed with the Commission, the eastern carriers published a mileage scale of export rates to Chicago from origins in Indiana and Michigan, patterned after the domestic corn mileage scale of rates in the east. That tariff covered whole grains only and excluded soybeans.

Numerous adjustments in the level of grain rates from Illinois and Iowa origins were made by rail carriers serving the gulf ports. Other adjustments included a system of low gathering rates to points such as Cairo, Ill., and St. Louis, Mo., for movement beyond for export. More recently 100-car unit-train rates were published from Illinois origins to the gulf.

The Board of Trade argues that Chicago has an inherent advantage of its geographical location to the great productive area of the Midwest, however, the export rate adjustments on grain and soybeans which the rail carriers have made to competing tidewater ports have all but nullified that advantage. Thus, it is contended that a just, reasonable, and nonprejudicial grain-rate structure should be established to Chicago which, on the basis of present conditions, should not exceed 7 percent of the corresponding docket No. 28300 first-class rates.

To support that contention comparisons of rail rates were submitted including grain and soybeans from Indiana and lower Michigan points to Chicago and to North Atlantic ports; grain from Illinois points to Chicago, to North Atlantic ports, and to gulf ports; grain and soybeans from Iowa points to Chicago and to gulf ports; and corn from Illinois and Iowa points to Chicago and to Norfolk and to gulf ports.

For example, the single-car export rates on corn from origin points in Illinois on the Illinois Central Railroad average 44.6 cents per hundred pounds at the Ex Parte No. 267-B level to New Orleans averaging 7.7 percent of first class. From the same origins to Chicago the average rate is 25 cents and averages 9.2 percent of first class. This is what the Board of Trade calls rate disparity and to cure this situation the Commission is requested to require the railroads to publish a lower rate to Chicago not in excess of 7 percent of first class. This example is not unique but is common to all the rate exhibits sponsored by the Board of Trade.

Rates on soybeans from Illinois origins to Chicago and to the gulf ports for export are subject to a pending proceeding before the Commission docket No. 34348, *Board of Trade of the City of Chicago* v. *Illinois Central Railroad, et al.* A discussion of that proceeding would be improper here and will not be undertaken. However, the requested relief in this proceeding extends to soybeans for export and the contention that the present soybean rates to Chicago are unjust and unreasonable and unduly preferential to competing gulf and North Atlantic ports. To these allegations, there is something to be said.

Exhibits of record compare rates on soybeans for export from central Illinois and from southern Illinois origins to Chicago and New Orleans. The following table summarizes those exhibits.

CENTRAL ILLINOIS ORIGINS

To	Range of distances	Range of rates in cents per cwt	Range of percent of first class
Chicago	55-252	20 -30	8.0-11
New Orleans	657-836	37.5-43.5	7.1- 8.0
Southern Illinois origins			
Chicago	268-365	28 -33	7.2- 9.8
New Orleans	550-685	28 -37.5	5.9- 7.3

In all but three instances, the rate in cents per hundred pounds from any Illinois origin to Chicago is lower than the corresponding rate to the gulf. In the excepted three instances, Cairo, Metropolis, and Brookport, the rates to Chicago and to New Orleans are the same (28 cents). The 28-cent rates to New Orleans are depressed to meet water competition on the Ohio River, and the corresponding rates to Chicago are maintained with fourth section relief at intermediate origin points.

The Board of Trade has no quarrel with the rates on corn and soybeans from Iowa to Chicago. That conclusion is understandable from a comparison of the rates submitted by the board comparing rates to Chicago and to Houston, Tex. The average mileage from Iowa origins to Houston is 1,026 miles and to Chicago 317 miles. The average rate to Houston is 45 cents and to Chicago 24.6 cents, almost a 20-cent advantage to Chicago. The rate to Houston is 6.6 percent of first class and the rate to Chicago is 6.8 percent. This rate example best illustrates how unreasonable it would be to require a rate structure to adhere completely to a percentage of first class. To follow that theory, the Iowa rates to Chicago should be reduced to correspond with the 6.6 percent of first class to Houston, even though Chicago already has a 20-cent advantage. A similar situation exists on Iowa corn to New Orleans and to Chicago. The New Orleans rate is 44.3 cents or 6.4 percent of first class and the Chicago rate is 23.9 cents or 7 percent of first class.

At the hearing the witness for the Board of Trade was asked the following question:

> Administrative Law Judge: Mr. Polom, can you describe how you arrived at this 7-percent of first class on grain and soybeans that you would like to have as a result of this proceeding? How did you arrive at that?
>
> The Witness: Well, I took the export rates that were established by the carriers involved from Illinois and Indiana to the ports that they serve, on single-line movements.
>
> I took the same export rates that were established from Iowa to Chicago and compared them with the rates that were established from Iowa to the gulf ports by the carriers serving both ports, and again in single-line operation and I measured it; and using the first class rates, docket No. 28300 mile rates, I measured it to that standard and I found that the carriers from Iowa to Chicago, and this is in my previous testimony, we arrive at an average that was slightly less than 7 percent.
>
> The same is true comparing Illinois to gulf versus Illinois to Chicago, and I felt that this would be a reasonable rate structure to establish to Chicago.
>
> Administrative Law Judge: This is all you did; this is it?
>
> The Witness: Right.

No cost studies were made to determine whether the requested reduced rates would be compensatory nor does the record show that any consideration was given to privileges usually found in a grain tariff such as transit, storage in transit, reconsignment, inspection, and free time for loading and unloading. Nor does the record indicate what consideration was given, if any, to the effect market or carrier competition has upon the establishment of the rail rates to the gulf ports from origins in Illinois, Iowa, Indiana, and Michigan which are the basis of the allegations of preference and prejudice. All of these factors have a bearing on the rate structure.

EVIDENCE OF WISCONSIN PORTS

Witnesses on behalf of the State of Wisconsin submitted four examples of rates on corn and soybeans to Wisconsin ports compared with rates from the same origins to Portland, Oreg., and Seattle, Wash. The rates to Milwaukee, Green Bay, and Superior are as follows:

Origin	Rate to Milwaukee-Green Bay	Rate to Superior
	(Cents per cwt)	
Des Moines, Iowa	33.5	33.5
Marion, Iowa	28.5	33.5
Omaha, Nebr	37.0	37.0
Yankton, S. Dak	41.5	42.5

In each example, the rates shown above were compared to a multiple-car rate of 64.5 cents from the same origins to Portland and Seattle. No comparisons were made for rates on grain from the same origins to the gulf or Atlantic ports.

On rebuttal, a railroad witness found the rates shown by the Wisconsin witness to be in error. The correct single-car rates, minimum 110,000 pounds, are as follows:

Origin	Rate to Milwaukee-Green Bay	Rate to Superior
	(Cents per cwt)	
Des Moines, Iowa	[1]24.5	33.5
Marion, Iowa	[1]20.0	[1]33.5
Omaha, Nebr	[1]33.5	[1]33.5
Yankton, S. Dak	[1]40.0	[1]42.5

[1] C M St P & P Tariff 18535-G, I.C.C. B-8260, Item 560-A. As to Milwaukee and Superior the rates shown were in effect prior to December 21, 1971.

The 64.5-cent multiple-car rate to Portland and Seattle shown by the Wisconsin witness is also in error and should be 67.5 cents. It was found just and reasonable in *Corn & Soybeans, Midwest to Pacific Northwest,* 339 I.C.C. 465 (1971). The minimum shipping requirement is 475 net tons per shipment in five hopper cars; at the carrier's option two boxcars may be substituted for one hopper car, with a minimum weight of 110,000 pounds per boxcar. According to the railroad witness, no traffic is moving on the 67.5-cent multiple-car rate to the west coast.

Comparisons of single-car rates to Wisconsin ports with multiple-car rates to the Northwest Pacific coast ports is without merit. The single-car rates on corn and soybeans from the same four Midwest origins to Portland and Seattle are shown below:

		Rates from Des Moines and Marion	Rates from Omaha and Yankton
		Cents	
Corn	80M	147.5	92.5
Soybeans	100M	140.5	128.0

Clearly, on a dollars-and-cents basis the Wisconsin ports have a substantial advantage.

EVIDENCE OF SEAWAY PORT AUTHORITY OF DULUTH

The combined grain elevator and storage warehouse capacity at Duluth/Superior exceeds 76 million bushels. Receipts of all species of grain and soybeans at Duluth/Superior were shown for the years 1966 to 1970 and to September 1, 1971. For 1970 grain receipts exceeded 248 million bushels and the export shipments by water for the same year exceeded 154 million bushels.

Due to reduced rates on hard red spring wheat established by the railroads from North Dakota and Montana origins to Duluth, the witness has no further concern with the wheat rates.

A comparison of rates on corn and soybeans from origins on the Chicago and North Western Railroad in Minnesota and northern Iowa to Duluth/Superior and to New Orleans shows the rates to Duluth/Superior range from 21 to 31 cents and average 7.05 percent of first class. The rates to New Orleans from the same origins range from 44.5 to 66 cents and average 6.91 percent of first class. Judged by the percent these rates are of first class, Duluth has no criticism and, in fact, endorses such a relationship as a gauge to measure rates.

Effective August 28, 1972, the Milwaukee Road published export multiple-car rates on corn and soybeans to Chicago, Milwaukee and Duluth from origins in Minnesota, Iowa, and South Dakota. Those rates that range from 19 to 39.5 cents to Duluth are compared to the multiple-car rate of 67.5 cents from the same origins to Portland, Oreg. Despite the fact that the aggregate minimum weight, both per shipment and per movement, is several times that of the 475 tons minimum in the rates to Portland, the rates to Duluth show a greater percentage of first class than the rates to Portland and on that theory it is contended that a rate disparity exists. Admittedly, the 67.5-percent multiple-car rate to Portland is a paper rate and moves no traffic. A comparison of the single-car rates on corn and soybeans to Duluth and to Portland from the same origins in Minnesota, Iowa, and South Dakota shows the rates to Duluth to be lower by any standard. The single-car rates to Duluth range from 20 to 43.5 cents on both corn and soybeans. The corresponding rates on corn to Portland range from 92.5 to 147.5 cents and on soybeans from 128 to 140.5 cents per hundred pounds.

The Duluth witness states that a difference of 1 cent or less per hundred pounds in a grain rate will determine the port a shipper will select to route his grain. Moreover, the witness contends that the principal competition Duluth faces is the gulf ports not the Pacific coast ports, and, as noted, the rate relationship on corn and soybeans to Duluth and to New Orleans is endorsed, not criticized.

PORT OF TOLEDO

A witness for the port of Toledo made reference to the eastern railroads reduced rate adjustment on soybean meal from points in Illinois, Indiana, and Ohio to the North Atlantic ports effective February 24, 1968. That rate adjustment was protested by Toledo but was not suspended or investigated by the Commission. While Toledo has no intention to retry the matter here, nevertheless it contends that as a result of the reduced rates and the failure to adjust the rates applicable to Toledo, a diversion of soybean meal traffic occurred at Toledo. In 1967 Toledo exported 150,000 tons of soybean meal. In 1968 that tonnage decreased to 1,728 tons and there has been no soybean meal traffic through the port since 1969 to date. In reply the railroads' witness stated the basis for the adjustment was due to the development of soybean processing facilities along the lower Mississippi Valley area drawing large quantities of soybeans that formerly moved to midwestern processors. It caused a diversion of 15 million bushels or 345,000 tons of potential soybean meal traffic from the eastern carriers for which the reduced rates were established in order to remain competitive. In 1971, the North Atlantic ports handled 9 million bushels of export soybeans, while the Lake ports handled 108 million bushels. Of that latter amount, Chicago handled 43 million bushels and Toledo handled 50 million bushels.

An exhibit of record shows Toledo enjoying a 20-cent per-hundredweight advantage and more in some cases in rail rates on grain for export from points in Indiana, Ohio, and Michigan when compared to the North Atlantic ports.

The grain elevators at Toledo with storage capacity of 27 million bushels are all privately owned and practically all the grain receipts are by truck.

BURRUS MILLS DIVISION OF CARGILL, INC.

This company has milling facilities in Dallas and Fort Worth, Texas. Wheat is purchased in Kansas and other wheat-growing States and brought to Dallas to be milled into flour. A large portion of the wheat flour is purchased by the U.S. Department of Agriculture and exported under Public Law 480 as relief shipments to needy countries such as India. All exports are made through the gulf ports from Baton Rouge to Corpus Christi and Burrus is required to pay the shipping charges to shipside at the port. Utilizing the gulf ports, Burrus is required to pay the line-haul rate to the port plus a 12-cent waterborne charge. A competitor that ships through a Great Lakes port only pays the line-haul rate. Therefore, it is requested that shipside rates, subject to a 12-cent waterborne charge, be prescribed for application on grain products exported through the Great Lakes ports.

The record shows that the railroads serving the Great Lakes ports do not offer nor are they physically able to furnish shipside service. Moreover, tariffs of many Great Lakes terminal operators provide that the transfer charges shall be applicable on agricultural commodities covered by Public Law 480 and shall be chargeable to and for the account of the vessel, its owners or their agents. Such tariffs are filed with the Federal Maritime Commission. In short, the Administrative Law Judge finds that the evidence submitted by Burrus is not sufficient to warrant the action requested and it is, therefore, denied.

WHOLE GRAIN AND SOYBEANS FOR EXPORT

On brief the Commission's Bureau of Enforcement takes the position that the record warrants a finding that export rates on whole grains, including soybeans, from origins in Indiana, Illinois, Iowa, and Michigan unduly prefer Atlantic and gulf ports and unduly prejudice the port of Chicago. It concludes that rates on such commodities from the indicated origins through Chicago at not more than 7 percent of the corresponding docket No. 28300 first-class rates would be reasonable and nonprejudicial.

That is the relief sought by the Board of Trade on behalf of the port of Chicago. Other Great Lakes ports seeking relief on grain and soybeans do not specifically adhere to a strict 7-percent formula but their exhibits relate export rates to percentages of docket No. 28300 domestic first-class rates.

The reasoning behind the failure to agree that export-import rates on general commodities should not be established on distance alone, becomes even more pronounced in the case of rates on grain for export. More so than any other commodity requiring transportation, grain is a heavy-loading, high-volume commodity. The demand for grain and grain products, not only within national boundries but throughout the world, seems to be insurmountable and increasing. As a result we find ourselves dealing with a highly competitive commodity. In this proceeding, it is the Great Lakes ports that are competing for more grain traffic and to accomplish that objective they are seeking a new grain rate structure.

In docket No. 28300 the Commission was dealing with class rates and the 28300 scale was not prescribed for application on export traffic. Due to the high competitive characteristic of grain and grain products there is no movement on first-class rates, rather grain moves on commodity rates. Class rates are based primarily on distance whereas commodity rates a high-volume traffic like grain are influenced by a variety of factors including carrier and market competition. If no other factors but distance are operative in a particular situation, first-class rates could serve as the standard of measuring rate relationships. Here, however, such is not shown to be the case. *Cooperative Grange League Fed. Exe.* v. *Akron, C. & Y. R. Co.*, 323 I.C.C. 174, 178. Moreover, rate relationships especially in the sensitive grain rate structure, should be disturbed only upon a comprehensive record showing a distinct and compelling need therefor.

The economics of the grain industry is a baffling one, to say the least, which accounts for the constant changes in the railroad tariffs made not only to accommodate the carriers, but also the shipping public as well as the ports served by the carriers on grain for export. There is no place for a rigid formula on export grain based on a distance principal alone, such as the Board of Trade suggests. It would create the very situation the Commission is usually called upon to prevent, namely, rate levels which deny a more distant port or locality the right to freely compete for available traffic. The problem calls for an expert informed judgment on a multitude of factors. All the rate examples shown by the witnesses on behalf of the Great Lakes ports on grain and soybeans from Illinois, Wisconsin, and the States west of the Mississippi River are lower in cents per hundred pounds than corresponding rates from the same origins to the North Atlantic, gulf, or Northwest Pacific coast ports. Given this fact, if the traffic is moving through a tidewater port in preference of the Great Lakes ports, other factors have entered into the selection of the port such as ocean rates, number of ship sailings, transit time, port terminal charges, and port facilities to name a few. To prescribe a scale of rates reflecting a flat 7-percent of domestic first-class rates would result in the reduction, in many instances, of grain and soybean rates to the Great Lakes ports. The record does not provide any rail costs for measuring whether such reduced rates would be compensatory. Nor does the record provide any shipper evidence as to whether such reductions might be an exercise in futility. Grain like any other commodity moving through the Great Lakes ports is restricted one-third of the year due to the seasonal closing of the St. Lawrence Seaway.

TABLE OF CONTENTS

Page

Appearances 1495
Procedural history 1495
Background 1497
Summary of parties' positions: Rate base 1499
    Overvaluation 1501
    Depreciation 1502
    Account 80 1503
    Accounts 90/76 1503
    Working capital allowance 1504
Summary of parties' positions: Rate of return 1504
    Rate of return and cost of capital 1504
    Diversification 1508
    Dividends 1509
    Deferred taxes 1510
    Account 532 1511
    Price level accounting 1511
    Funds flow analysis 1512
Discussion and conclusions: Rate base 1514
    The Commission's valuation policies 1515
    Net investment base 1519
    Depreciation 1522
    Account 80 1537
    Accounts 90/76 1540
    Working capital allowance 1541
    Average v. yearend or beginning-of-year rate base 1543
Discussion and conclusions: Rate of return 1543
    General revenue standards: A history 1543
    Railroad Revitalization and Regulatory Reform Act of 1976 1566
    Rate of return on Ex Parte No. 271 1567
    Diversification 1569
    Dividends 1570
    Deferred taxes 1571
    Account 532 1572
    Price level accounting 1572
Discussion and conclusions: Alternatives and supplements to rate base rate of return—funds flow analysis 1573
Ultimate findings and conclusions 1604
    Appendix A—Special Projects Counsel's submission 1607
    Appendix B—Replies to SPC 1626
    Appendix C—1972 statements of position and verified statements 1656
    Appendix D—Replies to 1972 statements 1707
    Appendix E—Imputed equity interest: Four railroads 1723
    Appendix F—Class I line-haul railroads selected earnings data for September 30, 1975, quarter and 12 months ended September 30, 1975 1724

Page

Appendix G—Rate base and depreciation analysis 1730
Appendix H—Depreciation study—Western Maryland Railway Company 1743
Appendix I—Listing of class I line-haul railroads, by district, included in study data base 1753
Appendix J—Forecast methodologies 1755
Appendix K—Class I line-haul railroads: Historical and projected financial statements 1943
Appendix L—Report on Commission staff study of the cost of equity capital 2020
Appendix M—Glossary of technical terms 2039
Appendix N—Annual report data summary 2041

Ex Parte No. 271

NET INVESTMENT—RAILROAD RATE BASE & RATE OF RETURN

Decided August 20, 1976

---

1. Upon investigation of the validity of the railroad rate base and the adequacy of the railroad industry's rate of return, examined the historical, technical, accounting, economic, and engineering aspects of the rate base; applied financial and economic analyses to determine the adequacy of the railroad's rate of return; and developed a funds flow methodology to evaluate better railroad revenue need in general rate increase proceedings.
2. Upon consideration of the record, found that the present original cost net investment rate base adequately reflects the value of railroad property and should be retained; that no evidence has been presented which would justify significant writedowns of net investment base; that straight-line depreciation as presently administered by the Commission should be retained; that presently stated depreciation reserves are adequate and are similar to what they would have been had ratable depreciation been followed; that the net debits in account 80, Other Items of Investment, should not be included in the investment base, nor should the account 80 credits be included while the debits are excluded; that it is unnecessary to modify account 76, Interest During Construction, to impute interest on equity funds employed in construction projects; that account 90, Construction Work in Progress, should not be included in the rate base; that the average, yearend and beginning-of-year rate base determinations are appropriate for different purposes and the use of all three methods should be continued; that both the deferred tax and flow-through methods of accounting for Federal income taxes may properly be considered in assessing the financial condition of the Nation's railroads; that separation of account 532, Railway Tax Accruals, into rail operating and nonrail capital-related items should be accomplished as part of the major revision of the rail system of accounts now under way; that railroad dividends have not been shown to be excessive; and that a 6- to 10-percent overall target rate of return would not be unreasonable.
3. Appropriate recommendations consistent with the findings made, including recommendations that a rulemaking proceeding be instituted to provide for having depreciation studies prepared by the railroads for review by the Commission; that the Commission adopt a 3-year cycle for the complete review of the depreciation rates and accrued depreciation accounts pertaining to a railroad's road and equipment property; that the Commission conduct depreciation feasibility studies and develop depreciation schedules; that accounting rule changes be considered by railroad management, the accounting profession, the Commission, and other governmental agencies to make accounts 2-1/2, 3, 5, and 39 fully depreciable; that the Commission's Cost and Valuation Section's Rail Form A working capital allowance formula supplant the traditional

formula; that an inflation adjustment to financial data through use of constant as well as actual dollars on both a general and specific price bases be used in assessing the financial condition of the railroads; that the Commission adopt funds flow methodology to evaluate railroad revenue need in general rate increase proceedings and otherwise to assist it in discharging its responsibilities under the Interstate Commerce Act, and that a special funds flow group be established to further develop, refine, and interpret funds flow data.

4. Order entered holding this proceeding open for further order of the Commission.

Appearances as shown in prior reports, 345 I.C.C. 55 and 340 I.C.C. 829, and, in addition, *A. C. Armstrong, Harry J. Breithaupt, Jr., William T. Kane, Charles C. Rettberg, Jr.*, and *John W. Tissue* for railroads; *Constance L. Abrams, Rodney E. Eyster, L. D. Santman,* and *James C. Schultz* for Federal departments and agencies; *Robert L. Calhoun* and *David M. Schwartz* for an individual shipper; and *Donald H. Boland, Martin J. Lewin, Joseph C. Lynch, William R. Southard,* and *John M. Vittone* for Special Projects Staff of the Bureau of Enforcement, Interstate Commerce Commission.

REPORT OF THE COORDINATOR

HARDIN, *Commissioner:*

By order of December 11, 1970, the Commission instituted this proceeding to determine whether the rate base used by the Commission for calculating the rate of return, or some other rate base, should be utilized as one of the measurements to judge the financial condition of the railroad industry. The net investment rate base used by the Commission at that time and since is the original or estimated original cost of property, including land, used in transportation operations, less depreciation, plus an allowance for working capital, consisting of cash and the cost of materials and supplies. Ex Parte No. 265/267, *Increased Freight Rates, 1970 and 1971,* 339 I.C.C. 125, 164 (1971) (hereinafter cited as *1971)*, and Ex Parte No. 259, *Increased Freight Rates, 1968,* 332 I.C.C. 590, 605 (1968) (hereinafter cited as *1968).* By preliminary report and order of November 5, 1971, the proceeding was expanded to include a determination of what constitutes a reasonable rate of return on the selected rate base, *Net Investment—Railroad Rate Base & Rate of Return,* 340 I.C.C. 829, 833 (1971) (preliminary report).

From the initial submissions, the Commission noted that the following would be issues: land valuation; capitalization of maintenance accounts; use of earnings for investment; debt/equity relationships; investment in nontransportation affiliates; the nature of used and useful property; and the adoption of alternatives to the fair-return-on-value test. These issues, to the extent embraced in the pleadings, as well as others, are discussed herein, though not necessarily as distinct and separate matters.

The scope of the proceeding was more precisely defined in the Coordinator's report of January 30, 1974 (*Net Investment—Railroad Rate Base & Rate of Return*, 345 I.C.C. 55(1974)), wherein it was stated that the investigation of the rate base was not instituted for the purpose of providing a guaranteed level of earnings, but rather because of persistent suspicions that the rate base used in computing the rate of return in general rate cases was overstated. It was observed in the January 1974 report that an examination of the rate base and rate of return would provide a better understanding of the facilities and financial requirements of railroads in responding to demands for efficient rail services.

During the course of this proceeding, many highly technical accounting and economic issues have been addressed by the parties to the proceeding and by the staff of the Commission. As a result of this dialogue between the parties and the Commission, new concepts have evolved, based in part on computer science that will enable the Commission to discharge its statutory responsibilities in a more efficient manner while at the same time offering guidance to the railroad industry in its search for economic viability. The depreciation study conducted by the Commission staff and first discussed in the report of the Coordinator, dated March 3, 1975, ***Net Investment—Railroad Rate Base & Rate of Return,*** 345 I.C.C. 410 (interim depreciation report), and further discussed herein is one example of this constructive evolution. Another example of a new useful device for viewing the railroad industry's performance and future needs is the funds flow concept developed by the Commission's staff during the course of this proceeding and discussed in detail in this report.

The depreciation study and the funds flow development, as well as the resolving of other matters initially conceived as being more directly related to the rate base/rate of return issues, in the Coordinator's opinion fully justify the time and effort that has gone into this proceeding. It is the Coordinator's hope and expectation that this proceeding will mark a new beginning for regulation of the railroad industry in the public interest.

At times in this report the institutional or editorial third person is used. However, the report is the sole responsibility of the

Coordinator and does not necessarily reflect the views of the Commission. Exceptions to this report may be filed 90 days from date of service and will be otherwise governed by the Commission's General Rules of Practice. This report will then be considered by the entire Commission in light of the exceptions. Contentions and requested findings not specifically discussed in this report nor reflected in the findings or conclusions have been considered and found not justified, or their resolution not necessary for the proper disposition of this proceeding.

BACKGROUND

As previously indicated, this proceeding was initiated in response to repeated criticisms by parties to general rate increase proceedings of the net investment base as a measure of need for additional revenues, of the railroads' general financial condition, and the reasonableness of net returns from a proposed increase—all primarily grounded on a suspicion that the base is overstated. *1971, supra.* The rate of return on net investment is widely used to indicate the profitability of past investments in both the regulated and unregulated business sectors. It is also used as a standard of fair or reasonable public utility earnings by regulatory commissions. In this context, a public utility, such as an electric power, gas, water, and telephone company, is entitled to a fair return on funds specifically committed to the provision of services plus recovery of invested capital through annual charges to depreciation.

The issues in this proceeding have required that the parties address many highly technical accounting problems which underlie the rate base approach as well as alternative revenue standards. The consideration of specific accounting procedures is critically important whenever they affect adversely the attainment of the desired objectives of regulatory earnings policy, that is, to provide the appropriate incentives to attract adequate capital funds and to encourage desirable investments and service improvements. In order that the considerable attention devoted to accounting problems not detract from the larger economic issues, it is desirable to put the matter considered in this proceeding in perspective at the outset.

As applied to the railroad industry, rate of return on investment is a useful indicator of relative profitability. It is not, however, appropriate as a standard of reasonable earnings on the same basis as used in public utility regulation. There is an apparent similarity between railroads and such utilities in the sense that both require huge capital investments and provide services of unusual public necessity. This similarity, however, fades in significance as a practical guide to regulatory policy when recognition is given to the economic circumstances surrounding their respective operations. For the most part, public utilities function as single-firm monopolies in circumscribed markets. When demands for services require, utilities are obligated to finance and construct such plant as may be needed irrespective of the costs involved. To meet this situation, the utilities' revenue needs are calculated as the sum of operating costs, including depreciation, plus a fair return on the rate base as determined by the regulators. As a consequence of the reasonable assumption that the protected market will support the rate structure implied by the revenue needs, the business risk related to the low capital turnovers is shifted from the owners and creditors of the utility to consumers.

The structure of the railroad industry is vastly different. It operates as a national system with much of the traffic moving via the facilities of two or more lines. As a result, revenue level adjustments cannot be made on a single-firm basis but are applied on a national or regional basis. Due to the varying operating conditions and relative efficiencies and financial condition, the revenue adjustments will impact differently in the individual carriers. Moreover, the industry encounters varying degrees of intramodal and intermodal competition in the multiple markets served. Despite any authority this Commission might grant to increase the level of revenues through rate adjustment, competition would curb the opportunities to apply the full measure. Since revenues required by the implementation of a fair return on rate base standard, as used in the regulation of public utilities, cannot be obtained, it would be futile, indeed, for the Commission to rely upon it exclusively as the test of reasonableness. Rather, its role in railroad general revenue proceedings as just one financial indicia of revenue need, as discussed below, should be maintained.

Beginning in 1966, the Commission has been confronted with a series of general rate increase petitions consisting for the most part of emergency increases in revenues needed to offset conditions of increased operating expenses, depressed earnings and working capital, and the need to add to and replace deteriorating plant and equipment in order to maintain adequate rail service. In evaluating the railroads' revenue needs, the Commission has held that rate of return on net investment is a significant but not exclusive measure of the financial health of the industry and has thus given weight to other financial indicators. The Commission has repeatedly rejected the argument that a return on rate base judged fair or not unreasonably high is necessarily a valid measure of just and reasonable rate levels. Thus, while the returns on capital invested may be judged substandard or inadequate when compared to the earnings experience of other industries, or to the interest costs of new financing, a higher level of rates necessary to produce higher earnings may be found to be unjust and unreasonable. On the other hand, the Commission has held that a rate of return determined to be substandard is "* * * at least an indication that the underlying rate level is within the zone of reasonableness," *1968, supra,* at 603. A more extensive discussion of the Commission's use of return on net investment in general revenue proceedings appears after the summaries of the parties' positions, below.

SUMMARY OF THE PARTIES' POSITIONS: RATE BASE

This section will highlight the positions of the parties on rate base and rate base-related issues. Appendixes A-D hereto contain a detailed statement of the parties' positions.

Evidence presented in this proceeding but not specifically discussed in this report nor reflected in the findings or conclusions has been considered by the Coordinator and a determination was made that discussion of this evidence is unnecessary to resolve the principal issues involved herein. Moreover, requested findings not specifically discussed nor reflected in the findings or conclusions have been considered and found not justified.

The Commission's currently used rate of return formula is net railway operating income (NROI) divided by net investment. Net investment includes investment in property (including land) at original or estimated original cost used in transportation operations, less depreciation, plus an allowance for working capital, consisting of cash and the cost of materials and supplies. *1971, supra,* and *1968, supra.*

Net investment is based on original cost, as adjusted by the basic valuations performed by the Commission in the 1914-1933 period, as required by section 19a of the Interstate Commerce Act. Such a base contrasts with one structured on so-called fair value, which embraces values in addition to original cost—evidences of reproduction cost, market value, and other indicia of value.[1] By amendment to section 19a in the Emergency Transportation Act of 1933, this Commission is now required only to keep itself informed of the changes in costs and values to permit revisions of the basic valuations, rather than to undertake, annually, detailed valuation inventories to update the basic valuations referred to in section 19a(f).

This proceeding was instituted in response to allegations by shippers in railroad general increase proceedings that the railroads' net investment rate base was overstated. See, for example, *1971, supra,* 163-166. On the other hand, the railroads favor continued use of the net investment base as presently defined by the Commission subject only to the qualifications (1) that such a base be associated with a rate of return "which recognizes present-day realities with respect to high replacement costs and current costs of capital," and (2) that the net investment base be increased by the relatively small amounts disallowed by the Commission in *1968, supra,* 604-5, in account 80, Other Elements of Investment, and account 90, Construction Work in Progress (or in the alternative, an adjustment through account 76, Interest During Construction, of similar effect). All other parties of record in this proceeding, save one, do not take issue with the use of depreciated original cost. Waterways Freight Bureau favors adjusting for inflation through allowing a replacement cost accounting adjustment. As previously indicated in the *January report,* nothing then, or now, of record warrants such a radical departure from present practice. *January report,* 345 I.C.C. 55, 57 (1974).

Nevertheless, practically all parties, including the railroads as noted, merely offer some adjustments to the net investment base concept. General Services Administration (GSA), for example, urges the Commission to strengthen its surveillance of the net investment base by reviewing specific transactions on an exception basis for reasonableness and prudence. GSA also suggests that ceiling prices be set on amounts charged regulated carriers by their affiliates. National Industrial Traffic League (NITL or NIT League) recommends that net investment base be decreased for any property that is not fully utilized or reflects excess capacity. The carriers would be expected to inform the Commission of such property under NITL's plan. General Mills, Inc. (GMI), however, does not urge the Commission to require exclusion of property which lacks earning power. GMI questions the Commission's ability to undertake this task without deeply invading the carriers' proper managerial prerogatives. The Special Projects Counsel[2] (SPC) proposes a number of relatively minor accounting changes in the rate base calculation, but supports the net investment concept.

---

[1] The fair or market value rate base concepts are out of favor; all Federal Commissions and 33 State Commissions use original cost. See, generally, A.J.G. Priest, *Principles of Public Utility Regulation* (Michie Co., Charlottesville, Va., 1969), Chapter 4, and, specifcally, National Association of Regulatory Utility Commissioners, *1973 Annual Report of Utility and Carrier Regulation* (NARUC, Washington, D.C., 1975), p. 811.

The positions of the parties on each of the significant rate base issues is set forth below under the following headings: overvaluation, depreciation, account 80, accounts 90/76, and working capital allowance.

Overvaluation.—The railroads consistently oppose any writedowns in present net investment base, contending that they have properly followed the Commission's accounting rules, that net investment base is very conservatively stated, and that unjustified writedowns would impair confidence in their credit. The railroads claim that the dollars in the present net investment rate base are of relatively recent vintage, showing that the $27.2 billion 1973 net investment base consists largely of the $32.7 billion in capital expenditures by the railroads in the 1946-73 period. The railroads are willing to take writeoffs on lines approved for abandonment by the Commission, without prejudice to those individual carriers seeking to set up reserves in advance of abandonment authorization and without prejudice to views expressed in a pending proceeding in No. 32153 (Sub-No. 2), Accounting for Retirement of, or Recognition of, Impairments in Value of Track Structure. The rails do not want property written off before physical abandonment without the concurrence of the affected carrier. The railroads want an opportunity to recover their past investment in property.

NIT League supports net investment base to the extent founded on original cost, less depreciation, of prudently acquired, and used and useful property. NITL contends that property should be revalued downward when sold for less than depreciated original cost. If such property is sold for more than depreciated original cost, then the gain should be attributed to the property accounts, i.e., that any gains above salvage value be treated as excessive depreciation expense to be recovered through the depreciation account. NIT League suggests that reserves be set up to handle property which is not fully utilized or reflects excess capacity. The carriers are expected under NIT League's proposal to inform the Commission which property, in their opinion, is in this category. GSA takes much the same position, adding that the Commission should review individual property acquisitions on an exception basis for their reasonableness and prudence. GSA is also concerned with affiliate transactions and suggests that ceiling prices be set where possible on affiliate sales to carriers.

---

[2] On December 5, 1974, the Special Projects Counsel was succeeded by the Special Projects Staff.

GMI does not favor the Commission's attempting to require large scale writeoffs of uneconomic property. It cites the Commission's alleged inability to cope with the mass of detail, the invasion of managerial prerogatives involved, and the inconsistency of requiring property to be maintained in service while attempting to write down the original cost of such property. SPC also believes that substantial revaluation and writedown of rate base is not "presently feasible or practicable." SPC does, however, assume a great deal of overvaluation in the rate base and adjusts for it through low suggested rates of return, as will be discussed further in the rate of return section. But SPC also suggests that traffic density studies may some day yield a yardstick by which to attempt rate base revaluation of certain railroad lines.

Depreciation.—Depreciation expense, along with other operating expenses, is deducted from gross operating revenues to derive net railway operating income. Accrued depreciation (sometimes called a depreciation reserve) is deducted from total assets to arrive at net investment. Thus, expense generated by rates of depreciation are relevant to rate of return and rate base, respectively, for any given year. No party seriously questions the Commission's prescribed straight-line depreciation method for depreciable railway property, except GMI which suggests that accelerated depreciation might be a better reflection of decline in economic value than straight-line depreciation.

GMI also questions the betterment method of accounting for track structure (sometimes called retirement-replacement accounting). No depreciation expense is recorded under betterment accounting. Betterments are capitalized, while replacements in kind are expensed. GMI claims that rate base is overstated by the amounts of depreciation not accrued. On the other hand, the railroads offer evidence purporting to show that net investment base would be approximately the same under either method of accounting. The SPC takes no position on this matter, deferring instead to the depreciation studies underway in the Bureau of Accounts, such as those discussed in a preliminary manner in the *interim depreciation report, supra.* GMI's problems with betterment accounting are fundamental to the concept. Betterment accounting assumes that track structure will be maintained in 100-percent operating condition and that maintenance expenses will be a relatively constant portion of operating expenses from year to year. In fact, as GMI points out, the railroads' own studies (ASTRO,[3] among others) show that track and tie replacements have been subnormal. GMI asserts that maintenance expenses fluctuate considerably from year to year with the varying degrees of individual railroad poverty or prosperity, or managerial propensity to manipulate net income.

Account 80.—Account 80 reflects the adjustments necessary to reconcile the railroads' original historical book values with the new book values required in 1963 by the Commission to be recorded as carrier assets on their balance sheets. Debit entries to account 80 reflect writedowns in asset book values to the 1910-14 valuation basis (primary property accounts 1 through 77). Credit entries to this account apply to writeups of asset book values to the 1910-1914 valuation basis, writedowns in capitalization following the reorganization of the 1930's and 1940's, and donations and grants. As it now stands, account 80 reflects unsettled items that have been largely written off.

The net debit balances in account 80 subject to future clearance total less than one-half of 1 percent of the 1971 net investment base, as calculated by the railroads. The railroads ask that this small amount be placed in the rate base, in seeking a reversal of the Commission's 1968 decision to exclude this item in *1968, supra.* The SPC, however, recommends that the debits be disallowed as a rate base item, but urges that the credits be included as a form of retirement reserve. GMI and NIT League favor no change in the Ex Parte No. 259 decision, *supra.*

Account 90/account 76.—The railroads initially sought to have the amounts in account 90, Construction Work in Progress, *or* in the alternative, to have the equity carrying costs of such amounts included in the rate base through a redefinition of account 76, Interest during Construction, which at present reflects only *debt* carrying costs. The railroads now acquiesce in the latter.[4] NITL,

---

[3] The American Railroad Industry: A Prospectus, America's Sound Transportation Review Organization, Washington, D.C., June 30, 1970. This is customarily called the ASTRO report.

[4] For rate base purposes, the expression "carrying costs" refers to the cost of capital committed to construction projects short of completion. The carrying cost of debt is the actual interest paid by the railroad on all borrowings of capital committed to the project. The carrying costs of equity is generally construed to mean a reasonable return allowance on any equity funds commited to the project.

GMI, and the SPC also favor the railroads' initially sought second choice—that is, including in rate base the carrying cost of equity, but not the amount of equity itself. NIT League would limit the equity return percentage to that of the existing debt carrying cost. The SPC, on the other hand, recognizes that the prime rate, bond yields, and various other rates could be used as an imputed interest rate for equity funds employed in railroad construction projects.

Working capital allowance.—The railroads favor the present method of deriving a working capital allowance—simply summing cash, material and supplies. NITL, however, objects to its continued use, arguing that the railroads' investment in cash, material and supplies fluctuates within too wide a range to be meaningful for rate base purposes. SPC favors, with NITL's support, the lesser of a "needed" working capital allowance or actual working capital. For the purpose of determining the railroads' working capital requirements, both the SPC and NITL recommend use of a "time lag" study similar to the cost finding method now used by the Commission. NITL would deduct from the working capital allowance so constructed any accrued taxes, noninvestor supplied funds it believes are not entitled to a fair return.

SUMMARY OF THE PARTIES' POSITIONS: RATE OF RETURN

This section discusses rate of return and revenue-related issues raised by the parties. As before, appendixes A-D contain a more detailed summary of the parties' positions. The following headings are used in this section: rate of return and cost of capital, diversification, dividends, deferred taxes, account 532, and price level accounting.

Rate of return and cost of capital.—The railroads present several cost of capital studies purporting to justify a 10-percent overall rate of return on net investment rate base. The lead analysis, presented by witness Foster in December 1972, weighs proportionally the cost of debt (4.87 percent imbedded cost as of 1970, or an estimated 5.50 percent imbedded cost by 1975) and a cost of common stock capital estimated by witness Foster to be at least 14 percent. The Department of Transportation (DOT) argues that rate of return derived through such an approach should not be the sole criterion of revenue need and suggests instead a projected funds flow analysis "to lead to a revenue policy suited to attain a rate of return consistent with the degree of risk experienced by the railroad industry."

GSA believes that rate of return analysis is entitled to probative weight in rate proceedings as only one of several indices of revenue need. GSA urges that rate of return be considered only on a carrier by carrier basis rather than by national or district groups. GSA also urges that diversified railroad holding companies be required to submit rate of return data on a holding company-less-carrier basis, as well as carrier-only, to give a signal when funds are being removed from carrier operations, or that nonrail operations are subsidizing railroad operations. GSA argues that no rate of return established in this or any other proceeding should be regarded as an entitlement of the carriers, rather it should be regarded "as a goal, attainment of which must depend in large part on the prudence, wisdom and efficiency of carrier management and operations as well as the level of transportation rates." GSA views the 10 percent proposed by the railroads as out of line with the range of 8 percent granted by the various Federal and State public utility commissions in 1972. GSA believes that public utility criteria "cannot justify promulgation of an optimum rate of return for the railroad industry above the general range of 8%."

NITL believes that rate of return should provide above "all actual legitimate operating expenses of furnishing adequate and efficient rail transportation, a return to cover (1) interest charges or the cost of debt *** plus (2) a return to the owners which is (a) comparable to that of similar undertakings, (b) will insure the retention and attraction of capital, and (c) in amounts adequate to foster sound economic health and development of rail transportation sufficient to meet the needs of commerce and of the United States." NITL does not desire to see rate of return as any guarantee that any individual railroad or the railroad industry as a whole will achieve a specified rate of return. NIT League believes the cost of capital approach is appropriate but that this should be done only by individual carriers rather than by national or district groups.

GMI questions the practical utility of setting rates of return in even a target sense, when there is little likelihood of such returns being earned with economically sustainable rates or without grossly discriminatory rates. GMI favors a projected flow of funds analysis, as does DOT, which, GMI believes, can lead to a means of attracting new capital to meet the long-run financial needs of the railroads in providing adequate future transportation service. Nevertheless, neither GMI nor its witness, Nelson, have serious difficulty with rail witness Foster's cost of capital analysis, although GMI does indicate it wishes more long-run financial data on capital requirements before accepting the railroads' requested 10-percent rate of return on net investment, or any other particular rate. Witness Nelson does not take serious issue, for the future, with Foster's 10-percent overall cost of capital recommendation, nor the embraced 14-percent cost of equity recommendation.

The SPC believes that fair rate of return guides for the three ratemaking districts, pending some sort of decrease in the presently computed net investment base, should be 4.26 percent in the East, 4.83 percent in the South, and 4.70 percent in the West. These are based on assumed weighted average costs of capital of 2.52 percent for roadway investment and about 7 percent for equipment investment and further assume that no return on new equity or retained earnings is needed or required. SPC finds that cash or funds flow under these returns will be adequate based on the railroads' 1971-73 financial experience, contending that the railroads have not shown a sufficiently specific need to make up deferred maintenance and to add new capital projects. This alleged failure on the railroads' part is indicated, in the SPC's view, by the refusal of the railroads to supply such information to the SPC in a 126-commodity breakdown, or in some other form acceptable to the SPC.

On brief, the SPS (successor to SPC) made several concessions substantially weakening the SPC's suggested fair rate of return guides. First, SPS now agrees with the railroads that the 2.52-percent roadway rate of return taken from nonarm's length leased roadway transactions in the East is not appropriate. Moreover, the SPS is also convinced that the concept of separate rates of return for road versus equipment is not appropriate. SPS now recommends that the more typical approach of meeting the needs for the various sources of funds be used. SPS now believes that the following criteria for a maximum rate of return should govern:

1. *Debt*—An amount adequate to meet the interest on imbedded debt and attract creditors to meet imminent debt requirements;
2. *Leases*—An amount adequate to meet the lease payments but no greater than would have been necessary to attract a reasonable mix of debt and equity directly at the time the lease was executed;
3. *Equity*—An amount comparable to the available return on equity in other industries where the risks to the investors are comparable.

In SPS's opinion, the adoption of these criteria will provide the necessary flexibility to adjust to changing economic and capital market conditions.

In reply to the SPC, NITL agrees in large part with the SPC's analysis except for the SPC's interim fair return guides which NITL fears will become prima facie proof of revenue need to the exclusion of other factors. NITL also now argues that the interregional nature of railroading precludes setting different regional rates of return, but rather that this should be done uniformly on a national basis, a change from its prior position in favor of only individual carrier returns.

GMI, in its reply to the SPC, has no objection to rate of return analysis as long as it is not the only factor considered by the Commission in assessing revenue need. GMI feels that the SPC has overlooked the most useful function of rate of return analysis—that of indicating the cost of new capital. GMI alleges that SPC appears to have overlooked the cost of capital as a "direct expense" justification for rate increases. GMI favors "direct expense" increases as an appropriate basis for rate increases without being delayed by "endless questions" of appropriate rate base or rate of return. "Direct expenses" in its view should include the "most volatile and inflated" cost of all—the cost of capital. GMI notes, by contrast, that the SPC believes that internally generated capital (sometimes called retained earnings) requires no return. GMI contends that the SPC has misused funds flow analysis to support the SPC's proposed rate of return guides on the apparent assumption that no new investment is needed or required.

In their reply to the SPC, the railroads contend that the question of whether a given rate structure can earn a particular rate of return is not for Ex Parte No. 271 to resolve, but is for another proceeding. The rails disagree with the SPC's view that retained earnings are cost-free and should have no return. The 2.52-percent eastern leased roadway return is said to be improperly imputed to the railroads as a whole by the SPC, since it is a return largely based on nonarm's length transactions in the East between lessor-owner Penn Central and lessee-operator Penn Central, based, in part, on tax considerations. The railroads assert that nothing the SPC says effectively challenges the rails' view that a 10-percent rate of return "opportunity" is needed.

Specific current or incremental cost of capital studies are presented for Burlington Northern, Southern Pacific, Union Pacific, and Southern Railway showing costs of capital in the 10-12 percent range, which are said to be generally comparable to Foster's 10-percent cost of capital.

The railroads also offer an industrywide study, presented by Southern Pacific witness Williams, purporting to show that the real 1973 rate of return is less than one-half of 1 percent and that the remainder of the reported rate of return for 1973 is solely the result of inflation. Williams' study adjusted reported income for inflation by increasing allegedly inadequate depreciation charges to a current value basis for freight train cars and locomotives.

Diversification.—There are differing positions among the parties on the effects of railroad diversification into nonrail enterprises. GMI urges the Commission to neither discourage nor restrict diversification by railroads into nonrail activities. GMI's theory is that increased capital investment in railroad operations ought to result if railroads are a part of diversified corporate systems with prospects of stable or increased earnings. GMI's witness Nelson assumes that profitably diversified companies will have more and lower-cost capital available and perhaps a greater willingness to invest their funds in railroad operations, than companies whose capital and earnings prospects are limited to those of rail operations alone. Nevertheless, GMI witness Nelson concedes that the general downtrend in rail-based earnings makes investment in rail operations generally unattractive, and cautions that diversification is no cure-all for railroad financial ills.

On the other hand, GSA sees the possibility of carrier funds being depleted to aid nonrail enterprises without benefit, and perhaps harm, to rail operations. GSA recommends that net earnings or profits from nonrail activities be added to net railway operating income before calculating rate of return. Any losses from nonrail operations, however, would be excluded under GSA's proposal. GSA also recommends a "diversified earnings" reserve to handle extraordinary nonrecurrent, nontransportation transactions to spread their effect over a series of years, to avoid distortions in carrier finances. These changes are recommended in order to preserve the integrity of the carrier as a financial entity. GSA urges the Commission to formulate a diversification policy for railroads. In considering ratemaking policy, GSA further recommends that when carrier rate of return data is offered that similar data on the holding company be required and that the Commission exercise the closest scrutiny over any and all significant transactions between conglomerates and their carrier affiliates to prevent carrier revenues or assets from being unwarrantably depleted.

In its reply to GSA, GMI indicates its belief that mandatory assignment of nonrail profits to assist rail earnings might further impair investor confidence in the railroad industry and stimulate further out-migration of funds away from railroad operations. GMI would encourage nonrail enterprises, including major shippers, to invest in railroad equipment and facilities.

Also, in reply to GSA, the railroads contend that diversification may well increase and stabilize total earnings, but, in any event, that earnings from railroad operations alone must still be adequate to support increased capital investment in railroad operations. Rail operations, it is implied, should be self-sufficient. The railroads show the following data on nonrail income as a percentage of total income:

Net railway operating income and other nonrailway income ($00,000 omitted)

Year	Net railway operating income	Other nonrailway income	Total income	Other as a percent of total
1971	$695.5	$422.5	$1,118.0	37.8
1970	485.8	482.4	968.2	49.8
1969	654.7	505.2	1,159.9	43.5
1968	677.6	499.6	1,177.2	42.4
1967	676.4	457.5	1,133.9	40.3
1966	1,045.9	399.5	1,445.4	27.6
1965	961.5	365.4	1,326.9	27.5
1964	818.2	368.9	1,187.1	31.1
1963	805.6	330.1	1,135.7	29.1
1962	725.7	325.6	1,051.3	31.0

Dividends.—GMI presents an analysis showing that the railroads have paid greater dividend yields upon market share value than groups of industrials, public utilities, airlines, and trucking companies, and thus have a smaller cash flow available for reinvestment in railroad operations. Dividend yields for class I railroads in GMI witness Nelson's 1956-1970 study period show dividend yields 50-percent higher than for industrials, and considerably above that for public utilities. GMI fears that this level of dividend payouts is causing the railroads to require excessively high internal rates of return, or sometimes called capital budgeting cutoff rates of return, on new railroad capital projects.

The railroads reply that most capital projects are not subject to rate of return or capital budgeting cutoff rates because many such projects are required by minimum standards of service whose rate of return may not be easily measurable and verifiable (*e.g.*, track maintenance) and because there are other projects without a rate of return, or a negative economic rate of return, involving safety and environmental requirements. The railroads also argue that the existing level of dividend payments is necessary to compensate common stockholders for the lack of price appreciation in their shares of stock. The railroads argue that dividends are a payment for the use of capital not unlike the payment of interest on debt; dividends are said to be the wages of capital. According to the railroads, if dividends are taken as a percent of shareholders' equity, as the railroads show, rather than as a percent of market share value, as GMI has shown, then the railroads' dividend yields are substantially below those of the industrials. The railroads also claim that reinvestment of the stockholders' dividends would have only a minimal impact on the railroads' earned rates of return.

Accounting for deferred income taxes.—For ratemaking purposes, the SPC urges the Commission to continue using the so-called "flow-through"[5] method for recording income taxes. Essentially, two arguments have been advanced in the past for rejecting deferred taxes[5] in favor of the flow-through method. First, it is argued that the deferred basis of calculating taxes forces upon the present shipper higher rates to compensate the carrier for the increased taxes it may or may not have to pay in the indefinite future (this is because part of the carrier's deferred tax liability is charged off to present income). Secondly, it is argued that deferred taxes represent a liability created at the discretion of management and, as such, does not represent investor supplied capital on which a rate of return should be allowed for ratemaking purposes.

On an opposite note, GMI disagrees with the SPC's recommendation upon the belief that flow-through accounting may encourage the railroads to pay excessive dividends because it inflates net income over that which would be reported from normalizing the tax burden (deferred taxes). GMI also believes that the flow-through method distorts the railroads earnings posture relative to the question of revenue need. The railroads also indicate displeasure with the SPC's proposal, indicating that the basic policy objective of Congress in permitting accelerated depreciation for tax purposes to stimulate capital investment would be defeated with respect to the railroads, any way, if the Commission elects to maintain its present posture on this issue.

---

[5] Under the "flow-through" method, only the taxes actually payable by the carrier are charged to income tax expense. The taxes actually payable for a period, however, are not always determined by the same revenue and expense items in arriving at accounting income for the same period. Under the circumstances the purpose of the deferred tax (or interperiod tax allocation) method is to apportion the tax effects of these revenue and expense items to the same periods used in determining accounting income.

Present Commission policy is that the railroads use the flow-through method of accounting for taxes for ratemaking purposes and the deferred tax method for reporting purposes. The benefits of accelerated depreciation for tax purposes and tax credits are, in effect, "flowed-through" to increase net income, thus reducing revenue need, a benefit to the rate-payers. The railroads and GMI note the apparent congressional intent to stimulate investment through accelerated depreciation and tax credits and imply, by contrast, that lower rates were not intended as results of the tax law. GMI also favors the deferred tax method for the additional reason that GMI believes the higher income from flow-through may be the basis for excessive dividends. On the other hand, SPC, with the general support of NIT League, argues that today's rate-payers should not prepay taxes of the future thus supporting the present flow-through method for ratemaking purposes and the decision of the Commission in *Accounting for Federal Income Taxes,* 318 I.C.C. 803 (1963).

Account 532.—In considering whether net railway operating income (NROI) is properly stated, SPC believes that account 532, Railway Tax Accruals, may not properly maintain a separation between taxes caused by rail activities as opposed to those caused by nonrail activities. This is sometimes called a failure to maintain the difference between above-the-line expenses and below-the-line expenses. SPC believes that the failure to maintain the separation may have a significant impact in depressing NROI for individual railroads. SPC, nevertheless, also believes that the impact is not significant on a regional basis. The railroads agree with the SPC in principle, and further agree that the overall impact for the purpose of this proceeding is not important in dealing with rate of return on a national or regional basis, citing Ex Parte No. 259, *1968, supra,* 604.

Price level accounting.—The railroads argue for an inflation adjustment to rate of return to account for inflation. In support, the railroads offer the previously mentioned study by witness Williams showing a real economic rate of return of less than one-half of 1 percent on the assumption that freight car and locomotive depreciation are restated on a so-called current value basis.

Funds flow analysis.—A matter accorded extensive consideration in this proceeding is the desirability of adopting funds flow analysis as an alternative method of measuring railroad revenue need. Both the DOT and GMI favor the use of this approach upon the belief that rate of return analysis, given its infirmities, should not be relied upon as the sole criterion for measuring revenue need. The philosophy here is that the Commission should consider the financial needs of the railroads in the "widest possible context." To this end, the DOT believes that a forward looking projected funds flow analysis of the industry would provide the Commission with a more complete and informed financial picture of the industry than is now available.

The usefulness of funds flow analysis in its various capacities is demonstrated by four parties of record, namely GMI, the SPC, the railroads, and the DOT.[6] GMI employs the concept to study the relationship of funds flow and earnings to cost of capital, dividend appropriations, and capital expenditures for the railroad industry and for selected individual railroads. For the period 1956-1970, its study relates the outflow of capital funds in the form of dividends, interest, and debt payments to the declining earnings record of the railroads during the period. On the basis of this analysis, GMI concludes that the industry's most critical problem is its inability to retain capital, a situation whose solution will require, at the minimum, a stable or consistently rising trend in rail earnings. To improve earnings, GMI recommends that the Commission give systematic and detailed consideration to the railroads' capital needs. In considering such needs, GMI urges that the Commission secure information from the railroads and other sources on a continuing basis to permit an appraisal of their present and future capital requirements. Analysis of the industry's future sources and uses of funds, in GMI's view, would provide the basis for establishing the railroads' long range revenue needs.

The SPC, on the other hand, believes that funds flow analysis should be confined to a much more limited role in the assessment of the carriers' financial needs. As the SPC sees it, the capital needs of the industry and the appropriate level of funds required to meet these needs are matters which only railroad management should pass upon. An appropriate earnings standard, in his view, must satisfy the interests of both the capital supplier and the consumer. In his opinion, however, an adequate flow of funds is a managerial goal which satisfies the investor, but not the rail shipper. Thus, the SPC does not view funds flow analysis as an appropriate substitute for rate of return analysis. In a more limited context, he would, however, use the methodology as a means for testing the adequacy of earnings levels allowed on other basis, including the rate of return rate base approach. It is in this limited role that he uses an abbreviated form of funds flow analysis to establish the reasonableness of his recommended maximum rates of return for each of the three districts. For the 3-year period 1971-1973, he finds that had the carriers earned on their investment in transportation property the maximum rates of return prescribed, their inflow of funds (cash generated through operations plus borrowings) would have been more than sufficient to cover their capital expenditure, roadway improvement, and debt service needs.

---

[6] Within the context of this proceeding, "cash flow" and "funds flow" analysis are used as synonomous terms referring to a methodology wherein the railroads' past, present, or prospective needs for funds (cash needs for working capital, procurement of equipment and improvements to plant facilities, retirement of debt, payment of dividends, et cetera) are measured against their ability to procure funds through income generation and from external sources, namely the capital markets.

While not advocating the strict use of funds flow analysis, the railroads nonetheless see merit in the concept and believe it to be an important consideration in the assessment of their financial viability. However, if the concept is to be employed in their behalf, they prefer that it focus on the industry's present and ongoing needs for capital and the level of earnings required to meet future demands for rail service. The SPC's retrospective analysis, they assert, is too static and historically oriented, taking into account past expenditure levels and earning and borrowing power constraints that have little significance as far as their future needs are concerned. Illustrative of the type of forward looking analysis that would take into account their future cash needs, the railroads contend, are the cash flow forecasts generated by the FROG (Financial Reports Output Generator) a computerized financial model developed for the Federal Railroad Administration. Cash flow projections for the southern carriers are supplied as a sample of the methodology employed by the computer model. Covering the 10-year period 1975 through 1984, the projections purport to show that if rail earnings are to be constrained within the maximum rate of return limits recommended by the SPC, the railroads' future cash needs to withstand the effects of inflation and provide adequate service will not be met.

Aside from the railroads, the DOT is the only other party of record which elaborates on the mechanics of developing a projected funds flow methodology. In its view, the railroads' future funds requirements should be projected upon the basis of their historical funds flows, past trends in productivity, and earnings needs to attract debt and equity capital. To illustrate the usefulness of funds flow analysis, it furnishes an analysis of the industry's gross flow of funds for the year 1959 through 1969, inclusive.[7] From this study, it identifies trends in inflows and outflows which when considered in conjunction with productivity data, provide an introspective basis for assessing managerial efficiency and forecasting revenue need.

As a suggested means for projecting labor and capital costs, the DOT furnishes a productivity analysis of the class I railroads for the 14-year period 1956 through 1969 which examines productivity changes relative to changes in wage costs and other operating expenses during this time frame. From such analysis, DOT proceeds to demonstrate that railroad output (ton-miles), labor productivity (ton-miles per employee) and capital productivity (ton-miles per road) can be projected to form the combined bases for forecasting labor requirements, wage trends, labor costs, nonlabor costs, and taxes. To this end, it recommends that the Commission elicit from the carriers the necessary budget projections as additional evidence in revenue need proceedings. Contrary to the SPC's view, DOT avows that the Commission's use of funds flow analysis in this context would not encroach upon management's decisionmaking powers to determine the appropriate level and mix of funds needed by the carriers to provide adequate transportation service. The use of this tool, it asserts, would simply permit the Commission to assess managerial performance relative to the question of revenue need.

DISCUSSION AND CONCLUSIONS: RATE BASE

Since this proceeding has its genesis in suspicions of an overvalued rate base, such issues will be resolved first. Rate of return/cost of capital issues, in conjunction with general revenue standards, will be considered second. Third, and finally, alternatives and supplements to rate of return/rate base as a measure of revenue need will be considered. There is necessarily some overlapping of issues, and thus some cross-referencing will be necessary.

---

[7] As defined by the DOT, "gross flows" represent the absolute value of both the inflows and outflows associated with any grouping of rail assets or liabilities that may occur simultaneously. For example, certain current assets may decrease causing an inflow of funds while a decrease in other current assets produces an outflow of funds. In contrast to "gross flows," "net flows" represent the net effect of the inflows and outflows weighed against each other.

The Commission's valuation policies.—Before turning to the specific issues of how to compute the rate base, it is well to consider a brief history of the Commission's valuation policies. Section 20 of the original 1887 act to regulate commerce authorized the Commission to require annual reports from the carriers to show, among other things, "the cost and value of the carrier's property, franchises and equipment." One of the original congressional concerns involved the relation between railway capitalization and the cost of railway construction.[8] Without accurate and dependable property records it would be impossible to determine the proper relation between the cost of property and the capitalization of a railway company. In 1888, the Commission's statistician called for an independent estimate of the present worth of railway property and the cost to its owners.[9] In 1898 in the *Smyth* v. *Ames* case, the Supreme Court laid down the fair value rate base rule.[10] The Supreme Court said:

> We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property being used by it for the convenience of the public. And in order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth.

Beginning in 1903, the Commission sought legislation to provide for an impartial valuation.[11] Testimony on value was being introduced by the carriers in rate cases, primarily to be available for later claims of confiscation in courts of law that rates were set too low. Valuation testimony proved difficult for the Federal and State governments and other interested parties to meet in the absence of an extended impartial study of information exclusively in the hands of the carriers. The Commission thus desired to have an impartial and authoritative valuation so that it could establish reasonable rates. State authorities also desired a valuation for State property tax purposes. Both Federal and State regulatory authorities desired an appropriate valuation base for depreciation purposes, as well as for an assessment of proper capitalization and for ratemaking purposes. After 10 years, a valuation law passed. The 1913 Valuation Act provided for a determination by the Commission of (1) the original cost to date, (2) the cost of reproduction new, (3) the cost of reproduction less depreciation, and (4) other values and elements of value, if any, of each piece of common carrier property used for common carrier purposes. The valuation effort began in 1914 with Valuation Order No. 3 requiring the railroads to report all changes in their properties to the Commission.

---

[8] Annual Report, 1888, p. 64, and Annual Report, 1908, pp. 83-85.

[9] Annual Report, 1888, p. 246.

[10] *Smyth* v. *Ames*, 169 U.S. 466, 546-547 (1898).

[11] Annual Report, 1903, pp. 26-32.

Every yard of excavation, grading, ballast, and concrete or stone work; every tie, rail, and building; every unit of motive power and rolling stock; every acre of land; and all other parts of the property were to be inventoried, priced and recorded as to condition and use. The carriers in 1916 had some 254,251 miles of railroad. At the height of the valuation effort in 1917-1919 some 1,550 persons were employed by the Commission in valuation work. By contrast, there are only about 65 people involved in valuation as well as cost work at the Commission as of January 1975.[12] With the passage of the Transportation Act of 1920 and the so-called recapture provisions in the original section 15a on February 28, 1920, the carriers began an intensive effort to have their valuations increased. The recapture provisions required the Commission to establish rates to permit the carriers as a whole to earn a 6-percent rate of return.[13] Individual carriers whose incomes exceeded the 6-percent standard were to have the excess recaptured, one-half to a Commission-administered loan fund and one-half to a carrier-controlled reserve to be used only for specified purposes. If a carrier-controlled reserve eventually exceeded 5 percent of the carrier's valuation, then the funds in excess of 5 percent could be released for general corporate purposes. The carriers, thus, had an incentive to have as high a valuation as possible to minimize the earnings subject to recapture. Extensive and laborious litigation on valuation for recapture purposes reached its peak in *St. Louis & O'Fallon Ry. Co.* v. *United States,* 279 U.S. 461 (1929). In *O'Fallon,* the Supreme Court reversed the Commission, holding, among other things, that the Commission unlawfully failed to give any weight to reproduction cost and, impliedly, that all of the Commission's valuation determinations to 1929 were incorrect and would have to be redone to be in accord with the Supreme Court's decision. Before the valuations were redone, and upon the Commission's recommendation, the section 15a recapture provisions were repealed and the section 19a valuation procedures were amended by the Emergency Transportation Act (ETA) of 1933.

---

[12] Interstate Commerce Commission, Budget Estimates Prepared for the Congress, FY 1976, January 1975, p. 37.

[13] For the 2-year period March 1, 1920-1922, the former section 15a(3) specified a 5 1/2 percent rate of return, with a 1/2 percent to be added in the Commission's discretion for additions and betterments chargeable to the capital accounts. This matter is further discussed in the rate of return section.

Section 19a(f) was amended by the ETA of 1933 to read as follows, as it does today:

> (f) Upon completion of the original valuations herein provided for, the Commission *shall* thereafter keep itself informed of all new construction, extensions, improvements, retirements, or other changes in the condition, quantity, use, and classification of the property of all common carriers as to which original valuations have been made, and of the *cost* of all additions and betterments thereto and of all changes in the investment therein, and *may* keep itself informed of current changes in *costs and values* of railroad properties, in order that it *may* have available at all times the information deemed by it to be necessary to enable it to revise and correct its previous inventories, classifications, and values of the properties; and, when deemed necessary, *may* revise, correct, and supplement any of its inventories and valuations. [Emphasis added.]

The principal effect was to eliminate the former requirement that the Commission update the basic valuations in "like manner," or in other words, to consider in an update all possible elements of value, including reproduction costs. The underscored words indicate that the Commission *shall* keep informed of the costs of changes but it *may* keep itself informed of costs and values of railroad properties so that it *may* have information available so that it *may* revise its basic inventories. The updating of the original valuations itself appears to be totally optional in recognition of the cost and expenditure of time needed to update on the original basis.[14]

The flexibility given the Commission by the ETA's amendment to section 19a(f) is further indicated by the following portion of the House report on the amendment's meaning:

---

[14] The basic 1913-33 valuations cost the Commission some $46 million. See I. L. Sharfman, The Interstate Commerce Commission, vol. 3, p. 42. See also Statement of William H. Tucker, Chairman, Interstate Commerce Commission before the Subcommittee on Surface Transportation of the U.S. Senate Committee on Commerce, on S. 755, S. 756, 757, and S. 758, June 8, 1967, p. 13. The railroads are estimated to have spent some $153 million on the effort as well. See Edwin F. Wendt, "Federal Valuation of the Railroads," in Bulletin 412, September-October 1939, American Railway Engineering Association, p. 100.

> The Commission will continue to collect all data necessary to a proper determination of value and to keep itself informed of all additions, betterments, retirements, and extensions of property of all common carriers. Under certain orders issued by the Commission, all steam carriers, since the date of their primary valuations, are required to report and file with the Commission the data necessary for the revision and correction of their basis [sic] inventories. These data are checked and policed by the Commission with a force insignificant as compared with that required in the initial physical inventories. Under the proposed amendment the Commission will not be required to reinventory the properties in the field and prepare and issue tentative valuation reports from time to time as required in the original or primary valuations. *It can, as its needs require, produce final valuations from time to time.* With the revision here offered by your committee, the Committee will be enabled at all times to obtain records of changes in the property and correct its inventories. The Commission *should* thus at all times have inventories and available data and studies for valuations and that intimate knowledge of the property, assets, and liabilities of the carriers which is essential in the regulation of rates, segregation of carrier from noncarrier property, consolidation of carriers, issuance of securities, divisions between carriers, annual depreciation rates, and in the discharge of new duties in dealing with the railroads as Congress may assume itself or lay on the Commission, such as involved in passing on loans under the Reconstruction Finance Corporation Act passed during the present session ***. [Emphasis added.]

H.R. Rep. No. 193, 73d Cong., 1st Sess. (1933), pp. 31-32.

For ratemaking purposes, the Commission has consistently considered some form of valuation data as the rate base denominator in a rate of return computation as a factor in its deliberations on general freight rate increases. The Commission, however, has used varying definitions of rate base since the 1930's. For example, in Ex Parte No. 175, *Increased Freight Rates, 1951,* 297 I.C.C. 17, 25 (1955), the Commission set forth three definitions of rate base in its rate of return table. Those definitions are (1) the railroads' definition, (2) the so-called Ex Parte No. 115 definition, and (3) the so-called Ex Parte No. 175 definition. The railroads' definition was historical book investment in railway property used in transportation service (less accrued depreciation and amortization of defense projects) plus material and supplies as reported to AAR.

The so-called Ex Parte No. 115 rate base was defined as the simple average of the cost of reproduction less depreciation and original cost less depreciation (the latter figure being estimated by using a percent of cost new 4 percentage points higher than that found in the reproduction estimate) plus the present value of land and rights, plus 2 percent of the total for other elements of value, plus an allowance for working capital, as developed from "Elements of Value of Property Used in Common-Carrier Service" formerly published annually by the Bureau of Accounts. Depreciation on the "reproduction cost new" basis was grounded on an estimated actual life basis, while depreciation on the original cost basis was and is on the straight-line accounting basis prescribed by the Commission's accounting rules. The 4-percent figure attempts to equalize the differences for the purpose of the Ex Parte No. 115 definition of rate base. This definition was used in the 1930's.

The so-called Ex Parte No. 175 method defined rate base as original cost, except land and rights, less accrued depreciation and amortization of national defense projects, plus present value of land and rights and an allowance for working capital, as developed from the Bureau of Accounts' elements of value. The Commission considered all three definitions in its Ex Parte No. 175 rate of return deliberations in the early to mid-1950's.

The Commission's present definition of rate base, at issue in this proceeding differs from the Ex Parte No. 175 method only in that the estimated original or actual cost of land is used, rather than estimated present value. *Increased Freight Rates, 1968, supra.* The railroads' book investment definition has been modified since 1963 because the values derived from the valuation project were then required by the Commission to be placed on the carriers' books in place of the previously recorded historical values and differences were to be either debited or credited, as appropriate, to account 80, Other Elements of Investment. The railroads, however, remain consistent in their desire to retain the essence of their traditional definition because they seek to add back account 80 values to the rate base and to add a factor for construction work in progress (through accout 90 or account 76) to the Commission's present definition of rate base. The railroads' support for such a rate base, in any event, is conditioned on its association with a rate of return that "properly takes into account the present realities of high replacement costs, higher on-going capital needs, and the inflated costs of capital."

Net investment base.—The Interstate Commerce Commission calculates the net investment base primarily from its prescribed accounting records of the individual railroads. In these accounts the Commission records (1) the purchase and sale costs of transportation property, and (2) estimates of depreciable property lives. The governing principle underlying these property accounts is that transportation property shall be recorded for ratemaking purposes according to the original cost.

For the industry under strict rate of return regulation, obsolescence under the depreciation method allegedly creates an incentive to delay economically justifiable replacements and retirements if discontinuance means the loss of opportunity to recover the remaining associated unamortized investment costs through depreciation. However, the Commission's Uniform System of Accounts does provide for writeoffs in the event of premature obsolescence.[15]

The Commission adopted the net investment base concept in the 1920's only after many fruitless labors with fair value rate base as a result of the *Smyth* v. *Ames* doctrine.[16]

All parties except the Waterways Freight Bureau (Bureau) advocate the continued use of depreciated original cost with some refinement as presently applied by the Commission. The Bureau argues that the Commission should utilize replacement cost as a base instead of original cost. Additionally, the Bureau alleges that rigid attachment to original-cost concepts in the face of sustained advances in the prices of capital goods over the past few decades and the outlook for continued price inflation produces seriously misleading indications of investment and profitability. While there is some merit to this position, it is the Coordinator's opinion that the Bureau's reproduction cost approach to rate base analysis is unworkable. Although the Bureau's general point of an inflation adjustment is valid, the Coordinator believes that adjustment to the rate of return, not to the rate base, is a more practical solution to the inflation problem.

Although unable to quantify precisely overvaluation of the railroad rate base, the SPC advocates writedowns of the present net investment base. Despite finding indexes of overvaluation of the net investment base, the SPC and his witness were unable to produce a used and useful rate base although various alternative types of rate bases were discussed, namely: net original cost, net trended original cost, net reproduction cost new, stock and bond value, and earnings value.

The Coordinator is in agreement with the SPC when he concedes that the net investment base cannot be sufficiently quantified with the requisite precision to equate a "used or useful" rate base; therefore, it is concluded that a writedown of asset values is not feasible or practicable at this time. According to SPC's witness, Robley Winfrey, the used and useful concept pertains to property used in railroad services and useful in such service. "Used and useful" has no practical definition under the Uniform System of

---

[15] 49 CFR 1201, §5-2.

[16] 169 U.S. 446 (1898). See generally, Locklin, *Economics of Transportation*, seventh ed. at 349-350 (1972).

Accounts. For example, a building that is held "primarily" for transportation operations but a part thereof is used for nontransportation operations is included in the transportation property accounts.[17] Thus, if only 51 percent of a structure is devoted to transportation operations, the structure may be included in the transportation property accounts. The Coordinator recognizes that determining whether some particular property is used and/or useful in railroad service is a matter of judgment by both railroad management and this Commission. The Coordinator finds that a "used and useful" study would require physical valuation of rail properties and would result in the expenditure of years of effort and millions of dollars which is unwarranted at this time.

One of the criteria for choice of a net investment base is its acceptability in terms of reliability to the operating railroads, the shipping public and investors. In other words, the various parties must have confidence in the base. It is apparent that SPC has no confidence in the present rate base and assumes that the net investment base is overvalued. The SPC and other parties have been unable to show significant property overvaluation, although the SPC has attempted to demonstrate some $3 billion in overvaluation.

Assuming *arguendo* the validity of the SPC theories, rate base would be reduced from approximately $27 billion to approximately $24 billion and the rate of return would be changed by less than 0.5 percent. With the rate of return at substandard levels, such an adjustment, even if acceptable, is virtually meaningless. It is noteworthy that, while certain parties have concentrated on possibly overvalued property, the same parties have consistently overlooked carrier property known to have increased in value, such as land. To properly value railroad property which has depreciated, as well as property which has appreciated, would require valuation studies of the kind undertaken by the Commission in the 1920's. Such studies as stated above are not practical. They are out of date when completed, not to mention extremely expensive and subject to wildly varying opinions on value. There is an existing procedure, however, for writing out of rate base those specific properties which have, in the carrier's opinion, become obsolete or are no longer used or useful. Additional reserves for such obsolescence may be set up under the supervision of the Commission; through the Accounting Board of the Bureau of Accounts. The railroads' accounts are, of course, subject to periodic Commission audit to insure conformity with the Uniform System of Accounts for railroad companies.[18]

---

[17] 49 CFR 1201 §2-4.

Accelerated depreciation.—All parties except GMI seem content with straight-line depreciation as presently administered by the Commission. GMI believes that accelerated depreciation is a better reflection of the decline in economic value of any technological asset used to produce earnings. Accelerated depreciation has the effect of allowing greater depreciation deductions in the earlier years than in the later years; on the other hand, straight-line depreciation provides for equal annual deductions over the life of a depreciable asset. The net effect over the life of the asset is the same; only the timing is different. In a growing industry, the effect of accelerated depreciation is to indefinitely defer taxes; in a static or declining industry, deferred taxes must be paid at some future time. One of the effects of using an accelerated method of depreciation instead of straight-line depreciation would be to increase expenses in the early years; this would serve to provide an additional layer of costs that can be used as additional revenue need justification for rate increases. A changeover from straight line to an accelerated method of depreciation would in most cases serve to increase the amount of depreciation charged by the railroads to income in the changeover year and in the years immediately following the changeover.[19] The additional depreciation charges, by increasing operating expenses, could arguably be charged to the ratepayers on the grounds that they create an additional revenue need for which rate relief should be granted. In 1943, the Commission shifted from retirement to ratable depreciation for certain road property; the shipping public, the future ratepayers, paid for this depreciation. The Coordinator sees no justification on this record to change from straight-line to accelerated depreciation.

Accrued depreciation.—As stated in the Coordinator's report of March 3, 1975, this proceeding was initially instituted in recognition of challenges to the validity of the Commission's current method of determining the railroad rate base used as a measure of revenue needs in general freight rate increase cases.

Claims have been made in this proceeding that the railroads' net investment base is overstated because the accrued depreciation reported on the railroads' books is deficient.

---

[18] 49 CFR 1201.

[19] Relevant factors to be considered here are the lifespan of the properties and the year in which the changeover is made.

The Commission currently requests the railroads to prepare and submit depreciation data which is then analyzed for determining depreciation rates. An important function of the analytical phase of this process is to assess the potential changes in the property for consideration when determining the rate. The railroads are the only source for this information. The Coordinator recommends that a rulemaking proceeding be instituted to provide for depreciation studies being initiated and prepared by the railroads for review by the Commission.

The Commission's Bureau of Accounts conducted a study of the validity of accrued depreciation as recorded in the railroads' books of accounts. The results of this study are reported herein.[20]

The Bureau of Accounts tested the appropriateness of the reported accrued depreciation. This was done by calculating the accrued depreciation for each road property account and equipment account for each railroad and comparing it with reported amounts to identify the areas of deficiency or excess in reported depreciation and to determine the materiality of the net deficiency or excess on a regional and national basis.

Prior to 1963, the rate base was predicated upon a reproduction cost new less depreciation basis. By Commission order in No. 32153, dated April 17, 1963, the books of account were brought into agreement with the valuation records and the basis for the net investment base became the adjusted books of account less recorded depreciation.

Of significance is the validity of recorded depreciation on road and equipment property.[21] This account is an offset to gross investment reported in the road and equipment property investment accounts, producing the Commission's currently used original cost, less accrued depreciation, or net investment rate base. Rates of depreciation are prescribed by the Commission pursuant to section 20 of the act. The Commission prescribes a composite annual percentage rate of depreciation for each depreciable property account.

The Bureau of Accounts study was limited to determining if the accrued depreciation for carrier operating property reported to the Commission is reasonably stated. The gross investment of each carrier is the investment reported to the Commission annually in Form R-1. The study draws no conclusions concerning the propriety of using the net investment as the proper rate base as opposed to some other concept such as fair value or market value.

---

[20] Specific data and a description of methodology are set forth in appendix G. See also the Coordinator's interim report of March 3, 1975 (Ex Parte No. 271, *Net Investment—Railroad Rate Base & Rate of Return*, 345 I.C.C. 410).

[21] 49 CFR 1201, account 735, Accrued Depreciation—Road and Equipment. See also Instructions for Depreciation Accounts, 5-1 Method.

Sixty class I railroads were included in the study. Fifteen carriers were excluded from the analysis because they were either bankrupt, or they owned no road property such as AMTRAK, or their road property is being amortized, or, as in the case of the Chicago and North Western Transportation Co., their road property has been recently written down to the point where an analysis would be meaningless. No attempt was made in the study to evaluate the impact of the 15 carriers on the reasonableness of railroad accrued depreciation reporting. In addition, the effect of ConRail on the results of region II is not ascertainable at this time. The carriers' data were analyzed on a regional and national basis only. The Simulated Plant Record (SPR) method was used to determine the net investment in the road property accounts. The actuarial method was used for the equipment analysis. This method was considered for analyzing the road property accounts but it was not feasible because of the time constraints and the volume of data.

Deficiencies in an accrued depreciation account are usually the result of several factors. They are:

1. Changes in accounting policy.
2. Premature retirements.
3. Overestimation of salvage.

A deficiency can exist by virtue of changes in accounting policy. For example, retirement accounting provides for recovery of investment costs by a single charge to operating expenses at the moment of retirement. If a change in policy occurs which substitutes depreciation accounting for retirement accounting and no provision is made to compensate for the age of the property at the changeover date, the accrued depreciation account will be deficient by the amount of depreciation that *should* have been accrued to the date of changeover. This factor is the basic criticism of the net investment base.

Premature retirement is also an important factor causing deficiencies in accrued depreciation. If property is retired before it attains the average life, sufficient annual accruals have not been generated to match this retirement loss in the accrued depreciation account. Retirements of a size that distort accrued depreciation are usually caused by:

1. Technological changes such as obsolescence or changes in the art of railroading. (An example would be a communication pole line system being replaced by a microwave system.)
2. Legislative actions such as the creation of Amtrak which caused abandonment of passenger service and substantial retirement of passenger facilities.
3. Large-scale abandonments of property due to declining traffic and exhaustion of natural resources.

The individual primary investment accounts of account 18, Water Stations, account 19, Fuel Stations, and account 20, Shops and Enginehouses are shown to be deficient in most accrued depreciation accounts on both a regional and national level. This condition is caused by the change from steam to diesel motive power where steam locomotive facilities were retired prematurely because of the change in technology. Since the retirements were not matched with corresponding additions, the investment level was reduced and the opportunity to compensate for the deficiency was minimized.

A third factor creating deficient conditions in an accrued depreciation account is the overestimation of salvage in determining the depreciation rate used to calculate annual accruals. Since salvage is in effect a credit to the accrued depreciation account when an asset is retired, the provision for salvage in the calculation of a depreciation rate must conform to actual circumstances of salvage recovery. Otherwise, the accrued depreciation amount will be deficient if the salvage is overestimated.

Excesses in an accrued depreciation account occur for two basic reasons. They are:

1. Longer average service lives.
2. Underestimation of salvage.

If the average life of an asset is shown to be longer than the average life on which the depreciation rate is based, the annual accruals will accumulate more rapidly than retirements occur. This in effect produces an overaccumulation, or an excess, in the accrued depreciation account.

If salvage is underestimated when the depreciation rate is initially prescribed, then the depreciation will be accrued at a rate higher than would be appropriate. Consequently, the depreciation will be overaccrued by the amount the actual salvage recovery exceeds the estimated salvage factor when calculating the depreciation rate.

The Bureau of Accounts' calculated depreciation study produced two sets of data:

1. A calculated net investment base, using calculated depreciation derived in accordance with the policy that there is little depreciation in account 2-1/2 (Other Right-of-Way Expenditures), account 3 (Grading), account 5 (Tunnels and Subways), and account 39 (Public Improvements—Construction), hence excluding these accounts.
2. A calculated net investment base, where calculated depreciation includes depreciation of accounts 2-1/2, 3, 5, and 39.

The reported net investment base was tested by being compared with the calculated net investment base shown by each set of data.

Comparison of reported net investment base with calculated net investment base, treating accounts 2-1/2, 3, 5, and 39 as largely nondepreciable.—When comparison is made on the national level, the following results appear:

NATIONAL ANALYSIS

TABLE 1

National comparison—net investment base—reported and calculated

Net investment base as reported	(1)	$15,754,000,000
Net investment base as calculated	(2)	[1]16,525,000,000
Difference (4.9 percent understatement (3) ÷ (1))	(3)	771,000,000

The difference of $771 million in table 1 above between the reported net investment base and the calculated net investment base appears significant in dollars, but when expressed as a percent of reported net investment it is not significant. Discussions relating to primary investment accounts have been included in the regional analyses; however, the comments are equally appropriate for the national statistics. Below is a comparison of selected accrued depreciation accounts that shows the magnitude of the deficiency or excess of the reported net investment compared to the calculated net investment:

---

[1] This figure, and comparable figures in tables 2 through 7 following, may be derived from column 3 of the national and regional tables in appendix G by substituting "reported reserve" figures for "calculated reserve" figures for accounts 2-1/2, 3, 5, and 39.

Account	Excess	Deficiency
1 Engineering		$44,648,000
6 Bridges, Trestles and Culverts	$183,595,000	
13 Fences, Snowsheds and Signs	26,929,000	
18 Water Stations		16,631,000
19 Fuel Stations		12,123,000
20 Shops and Enginehouses		52,875,000
26 Communication Systems	23,085,000	
27 Signals and Interlockers	78,641,000	
31 Power Transmission Systems	13,678,000	
37 Roadway Machines	60,327,000	
44 Shop Machinery		23,722,000

A review of the above listing, with a similar listing by region, reflects the same pattern and is discussed in the comments on each region. Those accounts affected by the conversion from steam to diesel motive power (18, 19, and 20) show a deficiency in the accrued depreciation amount caused by premature retirements. Those accounts most likely to be affected by other changes in technology show an excess in the accrued depreciation amount due to overestimating the depreciation rates when the newer property was installed.

Regional analysis—region I—New England region.—

TABLE 2

Comparison—net investment base—reported and calculated

Net investment base as reported	(1)	$212,320,000
Net investment base as calculated	(2)	211,513,000
Difference (0.4 percent overstated (3) ÷ (1))	(3)	807,000

Table 2, above, shows that the net investment base for region I is adequately stated. As a percent of reported net investment in the region, the base is overstated by a mere 0.4 percent. The $807,000 difference is miniscule relative to the size of the aggregate net investment in the region. One railroad in the region, the Boston and Maine Corporation, influences the overall statistics reported for the region. For example, most of the carrier's primary road property accounts reflect a deficiency in the accrued depreciation.

Although the study did not include an in-depth analysis of individual railroads, the Bureau of Accounts believed that the substantial deficiency in the accrued depreciation reported by the carrier was caused by large retirements of passenger properties and/or retirements which were not provided for when prescribing depreciation rates.

Even though the statistics of the Boston and Maine dominate the regional statistics, table 3, below, shows that even if the carrier is excluded, the reported net investment base would only be slightly understated.

TABLE 3

Comparison—net investment base—reported and calculated (excluding Boston and Maine Corp.)

Net investment base as reported	(1) $97,009,000
Net investment base as calculated	(2) 101,317,000
Difference (4.4 percent understated (3) ÷ (1))	(3) 4,308,000

Regional analysis—region II—eastern district, excluding New England region.—

TABLE 4

Comparison—net investment base—reported and calculated

Net investment base as reported	(1) $3,492,159,000
Net investment base as calculated	(2) 3,711,706,000
Difference (6.3 percent understated (3) ÷ (1))	(3) 219,547,000

Of the 20 railroads in region II, 3 make up 68 percent of the gross investment. These three companies, the Baltimore and Ohio Railroad, the Chesapeake and Ohio Railway, and the Norfolk and Western Railway are, therefore, a controlling influence on the statistics reported for the region. A summary of the data for the three companies shows:

	Percent	
Gross investment (region II)	100	$4,756,420,000
Baltimore and Ohio Railroad	12	561,654,000
Chesapeake and Ohio Railway	20	937,708,000
Norfolk and Western Railway	36	1,705,232,000
Total	68	3,204,594,000

Net investment base as reported	(1)	$2,374,559,000
Net investment base as calculated	(2)	2,556,500,000
Difference (7.7 percent understated (3) ÷ (1))	(3)	181,941,000

The analysis of the region by individual road primary accounts shows that the differences between the reported net investment base and the calculated base are primarily the result of offsetting excesses and deficiencies in the accrued depreciation account. Below is a comparison of selected accrued depreciation accounts that shows the magnitude of the deficiency or excess of the reported net investment compared to the calculated net investment:

Account	Excess	Deficiency
1 Engineering		$12,671,000
13 Fences, Snowsheds and Signs	$1,133,000	
18 Water Stations		7,097,000
19 Fuel Stations		4,272,000
20 Shops and Enginehouses		12,610,000
26 Communication Systems	4,971,000	
27 Signals and Interlockers	21,762,000	
31 Power Transmission Systems	6,162,000	
37 Roadway Machines	17,194,000	

The individual primary account of account 18, Water Stations, account 19, Fuel Stations, and account 20, Shops and Enginehouses, are shown to be deficient in the accrued depreciation amounts. These accounts reflect the impact of dieselization programs where steam locomotive facilities were retired prematurely due to the change in technology. Since the retirements were not matched with corresponding additions, the investment level diminished and the ability to make up the deficiency was minimized. The fact that a beginning balance in the accrued depreciation account was not established in 1943 when depreciation accounting for road property began is only one factor that contributes to the deficiency.

In other accounts, especially account 27, Signals and Interlockers and account 37, Roadway Machines, the accrued depreciation amount is significantly greater than the calculated amount. Two factors appear to be the reason for this condition. First, the estimated service life was much shorter than experience demonstrated. When items less than a unit of property are replaced the effect is to lengthen the accounting life of the asset. This occurred with signal systems and roadway maintenance units where components were replaced with no change in the investment account.

Second, if the salvage recovery is substantially different from the factor used in determining depreciation rates, experience has shown that the effect on accrued depreciation is significant since actual salvage is credited to the accrued depreciation account.

An additional factor should be considered in a review of this region. The institution of ConRail under the Final System Plan of the United States Railway Association will undoubtedly have a significant impact upon this region's investment base. Those railroads included in this report most likely to be affected by the reorganization are:

Ann Arbor Railroad
Erie, Lackawanna Railway
Reading Company

Regional analysis—region IV—southern region[22]

TABLE 5

Comparison—net investment base—reported and calculated

Net investment base as reported	(1)	$3,650,957,000
Net investment base as calculated	(2)	3,802,951,000
Difference (4.2 percent understated (3) ÷ (1))	(3)	151,994,000

Table 5 shows that the net investment base as reported is only slightly understated in region IV. Below is a comparison of selected accrued depreciation accounts that presents the magnitude of the deficiency or excess of the reported net investment compared to the calculated net investment:

Account	Excess	Deficiency
1 Engineering		$9,262,000
6 Bridges, Trestles and Culverts	$7,915,000	
13 Fences, Snowsheds and Signs	1,919,000	
17 Roadway Buildings		1,754,000
20 Shops and Enginehouses		17,248,000
27 Signals and Interlockers	10,988,000	
31 Power Transmission Systems	2,281,000	
37 Roadway Machines	16,148,000	
44 Shop Machinery		8,433,000

---

[22] Region III represents the eastern district which is a consolidation of regions I and II. For this reason no statistics are presented for region III.

As in other regions, the deficient amounts occur in accounts affected by dieselization through premature retirements such as road property accounts (roundhouses) and coaling stations and excesses occur in those accounts most likely to be affected by other technological changes such as communications equipment. Explanations for the excesses and deficiencies vary. The deficient accounts occur because the depreciation rates did not contemplate the premature retirements caused by dieselization, past accrued depreciation was not provided for when depreciation accounting for road property began in 1943, and the salvage factor tended to be overestimated when depreciation rates were initially prescribed. The excessive accrued depreciation amounts occur when estimated average service lives are shorter than experience subsequently demonstrates and salvage recovery is greater than anticipated in developing the initial depreciation rate.

Because of the minor difference between the reported and calculated accrued depreciation account, corrections to the account can be implemented in a relatively straightforward manner. This can be accomplished by transferring the excesses to those accounts displaying deficiencies, totally within account 735, Accrued Depreciation; Road and Equipment. Any residual amount can be accounted for in accordance with the specific conditions relating to an individual railroad.

Region analysis—region V—western district, excluding Mountain Pacific and Trans-Territory.—

TABLE 6

Comparison—net investment base—reported and calculated

Net investment base as reported	(1)	$2,064,216,000
Net investment base as calculated	(2)	2,171,377,000
Difference (5.3 percent understated (3) ÷ (1))	(3)	107,161,000

Table 6 above shows that the reported net investment base is understated 5.3 percent. While the dollar amount is significant, the resulting percentage is not in terms of impact on the net investment base. This amount does not appear significant. Below is a comparison of selected accrued depreciation accounts that shows the magnitude of the deficiency or excess of the reported net investment compared to the calculated net investment:

Account	Excess	Deficiency
1 Engineering		$4,069,000
6 Bridges, Trestles and Culverts	$34,509,000	
13 Fences, Snowsheds and Signs	4,105,000	
6 Station and Office Buildings		3,942,000
20 Shops and Enginehouses		4,993,000
24 Coal and Ore Wharves	7,414,000	
27 Signals and Interlockers	17,432,000	
31 Power Transmission Systems	1,845,000	
37 Roadway Machines	5,489,000	
44 Shop Machinery		5,069,000

This indicates that depreciation accruals over the years were higher than warranted. This was the result of unpredictable retirement practices of the railroads. One railroad in this region, the Chicago, Rock Island and Pacific, shows large excesses in the reported accrued depreciation account compared with the calculated, which constitutes 28 percent of the total reported excess accrued depreciation for the region. Excesses in the reported accrued depreciation account of financially troubled railroads are, in part, the result of a lack of funds for replacement of property. When property lives beyond normal expectations, higher maintenance than normal is performed to permit the company to remain in business and the life cycle of the property is extended.

The current plan to review the road property depreciation rates on a cyclical basis will minimize this problem by detecting shifts in company policy before the reported accrued depreciation account becomes distorted.

Region analysis—region VI—Mountain Pacific and Trans-Territory.—

TABLE 7

Comparison—net investment base—reported and calculated

Net investment base as reported	(1) $6,334,147,000
Net investment base as calculated	(2) 6,624,481,000
Difference (4.6 percent understated (3) ÷ (1))	(3) 290,334,000

The difference noted in table 7 above, while significant in dollar amount, does not appreciably affect the reported net investment base. Below is a comparison of selected accrued depreciation accounts that shows the magnitude of the deficiency or excess of the reported net investment compared to the calculated net investment:

Account	Excess	Deficiency
1 Engineering		$16,825,000
6 Bridges, Trestles and Culverts	$140,686,000	
13 Fences, Snowsheds and Signs	15,756,000	
16 Station and Office Buildings	18,461,000	
17 Roadway Buildings		4,862,000
18 Water Stations		9,031,000
19 Fuel Stations		5,975,000
20 Shops and Enginehouses		14,145,000
26 Communication Systems	18,574,000	
27 Signals and Interlockers	30,571,000	
37 Roadway Machines	21,064,000	
44 Shop Machinery		8,866,000

Analysis of the above figures indicates that the same general pattern exists in this region as in other regions. The primary investment accounts most likely affected by the conversion from steam to diesel motive power show deficiencies in the accrued depreciation amount. Those accounts most likely affected by technological changes show an excess in the accrued depreciation amount.

Comparison of reported net investment base with calculated net investment base, treating accounts 2-1/2, 3, 5, and 39 as depreciable.—In the interim report in this proceeding dated March 3, 1975, the Coordinator considered the possibility of depreciating the "nondepreciable" portions of account 3, Grading, account 5, Tunnels and Subways, and account 39, Public Improvements—Construction. The same considerations apply to the depreciation of account 2-1/2, Other Right-of-Way Expenditures. The impact of depreciating these accounts is reflected in the calculated accrued depreciation shown in appendix G for each region and for the Nation as a whole.

In summary, the impact of inclusion would be:

National statistics:		
Net investment base as reported	(1)	$15,754,000,000
Net investment base as calculated	(2)	15,511,000,000
Difference (1.5 percent overstatement (3) ÷ (1))	(3)	243,000,000

The analysis program calculated a reserve ratio for each primary account for each region as if depreciation had been accrued over the history of the asset. In prior years, the nondepreciable property contained in these accounts was considered to be completely restorable by maintenance and, therefore, not affected by age or usage. Subsequent evaluations have disclosed, however, that retirements do occur on a consistent and measurable basis. For this reason, the Bureau of Accounts concluded that for net investment base purposes, the investment in this property should be considered as recoverable.

Since only a minor portion of the investment in these accounts has been recovered, a deficiency is shown in comparing the calculated reserve to the reported reserve.

Impact on rate of return.—In summary, the reported net investment base differs from the calculated net investment base by a relatively small amount. If accounts 2-1/2, 3, 5, and 39 are considered largely nondepreciable, the national net investment base is understated by 4.9 percent. When these accounts are treated as depreciable, the national net investment base is overstated by 1.5 percent.

Accordingly, the Coordinator concludes that on a national or regional basis the reported net investment base is reasonably stated because it does not differ significantly from the calculated net investment base. However, in measuring revenue needs in general rate increase cases, it is advisable that the use of a reported base be accompanied with the calculated net investment base at the same time. The calculated net investment base should provide the Commission with additional information in making general increase decisions. Further investigations may be warranted should the reported base and calculated base result in a significant difference in determining railroad revenue needs.

Retirement versus depreciation accounting.—One of the questions in this proceeding concerns the impact of retirement accounting versus depreciation accounting on the railroad rate base and rate of return. It has been alleged that current rate basis is overstated by the amounts of depreciation not accrued.

During the course of this proceeding it was discovered, contrary to prior assumptions, that certain accounts have determinable service lives. Accounts 2-1/2, Other Right-of-Way Expenditures; 3, Grading; 5, Tunnels and Subways; and 39, Public Improvements—Construction had all previously been assumed not to have determinable service lives and, thus, have not been considered fully depreciable accounts, except for certain small portions. Assuming these four accounts are made fully depreciable as the present study indicates is possible, then the difference between reported and calculated net investment is reversed in direction, but not by a significant amount. The calculated net investment base thus becomes slightly smaller than the reported net investment base by about 1.5 percent, again not a significant amount. On either depreciation basis, there is no warrant for reducing rate base on unverified suspicions that depreciation is underaccrued by substantial amounts. Since accounts 2-1/2, 3, 5, and 39 were originally made largely nondepreciable on the assumption that determinable service lives were not possible, the Coordinator thus recommends that accounting rule changes be considered to make accounts 2-1/2, 3, 5, and 39 fully depreciable. This recommendation is in accord with the decision in *The Chesapeake and Ohio Railway Company* v. *Commissioner of Internal Revenue,* 64 T.C. 352, 400-401, (1975), insofar as the possibility of determining service lives for assets in accounts 3 (Grading) and 5 (Tunnels) are concerned. In *Chesapeake and Ohio,* et al., the railroad sought to depreciate its investment in grading and tunnel bores ratably over a 50-year period. The Tax Court recognized that tunnel bores and grading are assets which, although not subject to physical exhaustion through use, do possess limited useful service lives as determined through the use of statistical life studies.

Betterment versus depreciation accounting.—Under betterment accounting, no depreciation expense is recorded until the property subject to this method is retired. Betterments are capitalized whereas replacements in kind are expensed. As Mr. H. J. Brinner, Chairman, Accounting Division Association of American Railroads, and Controller, Norfolk & Western Railway Co., explains in his article titled "An Explanation of Railroad Accounting":[23]

> The betterment method of accounting by railroads for a part of their investment in transportation property is the single significant difference in their accounting practices from those of industrial companies, but the methods of both are in accordance with GAAP.[24] Under the betterment method, railroads capitalize the original cost of new track installed. No annual charge is made for depreciation as such and no charge is made to operating expenses until the track is replaced or retired. When individual rails, ties and other track material are replaced, all the replacement costs, including labor, are charged to expenses unless there is a betterment. For example, if 100 lb. rail is replaced with 132 lb. rail, that part of the replacement

---

[23] Brinner, H. J. "An Explanation of Railroad Accounting," The Office 79 (January 1976).

[24] Generally Accepted Accounting Principles.

> material representing a betterment (32 lbs.) is capitalized and the current cost of the replaced 100 lb. rail is charged to expenses. The capitalized costs are charged to expenses when an installation is retired from service and not replaced. If the date can be forecast when a branch line will be abandoned, its capital cost less estimated net salvage may be amortized by charges to expenses over its estimated remaining life. The underlying theory of the betterment method is that charges to expense on account of replacements and retirements in any particular year roughly approximate what would be a proper depreciation allowance.
>
> There is widespread misunderstanding, and diverse statements have been made, about the effect of betterment accounting on the reported net income of railroads. Some believe it results in an understatement of expenses and others that it results in an overstatement. Only about 16% of the railroads' total investment in transportation property is accounted for under the betterment method. All other depreciable assets, including bridges, buildings, communication facilities and rolling stock are depreciated over their estimated useful lives using the straight-line depreciation method.

It is the railroads' position, however, that investment base would be approximately the same under either betterment or depreciation accounting. A study was prepared to assess the impact of depreciation accounting on the financial results of a railroad.[25] The results of the study on the Western Maryland Railway Company showed that the rate base or rate of return does not significantly change by application of depreciation accounting to the track structure.

The Coordinator recognizes problems incident to betterment accounting as currently applied by the Nation's railroads. These problems are primarily concerned with the tax consequences of a changeover in accounting method and the impact of depreciation accounting for the track structure on the potential for deferred maintenance. It is further recognized that the application of depreciation accounting to track structure is not possible without prior action from other government agencies. In a recent Tax Court case involving the Chesapeake and Ohio Railway Company, the Tax Court held that the C & O's attempt to deduct depreciation amounts prior to retirement of property subject to betterment accounting constituted a change in its method of accounting for which the C & O failed to obtain the requisite consent of the Commissioner of the Internal Revenue Service.[26] The court, therefore, denied the application of a ratable depreciation deduction reasoning that even if the C & O had been able to demonstrate that its track structure in fact, would be retired in 50 years, it was not entitled to anticipate such ratable depreciation deductions without first acquiring the approval of the Commissioner of the Internal Revenue Service.

---

[25] Appendix H, Application of Depreciation Accounting to Track Structures Accounts of the Western Maryland Railway Company.

[26] *The Chesapeake and Ohio Railway Company* v. *Commissioner of Internal Revenue, supra.*

Until the difficulties of changing over from betterment accounting are resolved, it cannot be ascertained if such a changeover would inure to the public benefit. However, the Commission should keep apprised of the methodologies used in such matters, and should conduct depreciation feasibility studies and develop depreciation schedules for various property accounts.

General observations on depreciation.—Distortions exist on a regional basis in the individual accounts for accrued depreciation but these are caused by many factors, among which is the lack of past accrued depreciation prior to 1943; however, the overall net effect of all the factors is a reasonably stated net investment base.

The methods of determining service life, salvage, and accrued depreciation used for this study are initial efforts to update the processes through utilization of electronic data processing. To obtain the best evaluation possible of the rate base and rate of return, the Coordinator recommends continued research into the updating and upgrading of the Commission's depreciation data base and the processes used to analyze depreciation.

The depreciation rates and the accrued depreciation accounts are routinely reviewed by the Commission on a 5-year cyclical basis. These periodic reviews are made to assure current recognition of the effect of technological innovations, economic changes, and changes in the requirements of public authority. Due to the increasingly rapid shift of these factors, the Coordinator recommends adoption of a 3-year cycle for the complete review of the depreciation rates and accrued depreciation accounts pertaining to a railroad's road and equipment property.

In addition, the railroads should be required to submit depreciation studies for review by the Commission rather than for preparation by the Commission. Since individual railroads are in a better position to quantifiably identify innovations and policy changes affecting service life and salvage value, the responsibility for the determination of initial proposals regarding depreciation should be vested with the carriers.

Account 80.—Account 80, Other Elements of Investment, reflects the adjustments necessary to reconcile railroad historical book values with the ones required by the Commission in 1963 to be taken from its valuation studies. Such items are now largely written off. The 1972 balances in account 80 are: debits, $700 million and credits, $410 million. These amounts are relatively insignificant compared with a 1972 net investment base on some $27 billion. The Commission has rejected account 80 net debits for rate base purposes as unsupported historically recorded items, not consistent with the values established by the Commission's valuations pursuant to section 19a. Ex Parte No. 259, *Increased Freight Rates, 1968,* 332 I.C.C. 590, 604 (1968). The railroads argue that such historically recorded costs, nevertheless, ought to be recovered through the rate base. The SPC seeks to exclude the debits, but to subtract the credits.

Account 80 debits reflect writedowns in asset book values to the 1910-14 valuation basis. These writedowns were made to each of the primary property accounts 1 through 77.

Account 80 credits represent three types of entries:

(1) writeups of asset book values to the 1910-14 valuation basis.
(2) writedowns in capitalization following the reorganizations of the 1930's and 1940's; and
(3) donations and grants.

The Commission long ago recognized that the historical amounts originally entered by the railroads as the cost of property are unreliable as a measure of actual cost:

> *** Every balance sheet begins with "cost of property," against which is set a figure which purports to stand for the investment. This is no place to enter upon an extended criticism of the practice of American railways in the matter of their property accounts, nor is such a criticism necessary for the purpose in hand. It is sufficient to refer to the well-known fact that no court, or commission, or accountant, or financial writer would for a moment consider that the present balance-sheet statement purporting to give the "cost of property" suggests, even in a remote degree, a reliable measure either of money invested or of present value. Thus, at the first touch of critical analysis, the balance sheets published by American railways are found to be inadequate. They are incapable of rendering the service which may rightly be demanded of them. One cure seems possible for such a situation, and one only, and that is for the Government to make an authoritative valuation of railway property, and to provide that the amounts so determined should be entered upon the books of the carriers as the accepted measure of capital assets. Under no other condition can the Commission complete in a satisfactory manner the formulation of a standard system of accounts. Annual Report, 1908, p. 85.

In its order of April 17, 1963, in Docket No. 32153, Uniform System of Accounts for Railroad Companies, the Commission required that the property values shown in its valuation records for each carrier be placed on carrier books as a substitute for previously recorded historical values in the primary road and equipment accounts. This was done to provide "an accurate record of the cost of property used in transportation service." *Annual Report, 1964*, p. 54. Historical costs are those carried forward from the early days of railroad construction. Such historical costs often consist of large amounts unsupported by adequate records or evidence that such items in fact were the actual cost of construction. Some items originated as a single sum entered in the property accounts to balance the amount of capital stock and bonds issued. Other items reflect excessive amounts paid to affiliated construction companies in excess of actual construction cost. Such historical amounts are, therefore, not a reliable measure of the true cost of common carrier property.

Substantial sums were required to be eliminated from the primary accounts as a result of the 1963 order. The excess of total adjusted historical cost over/valuation-based costs was authorized to be written off to retained income (surplus). Where this excess was not so written off, the order required the differences between total adjusted historical costs and valuation-based costs to be placed in account 80 and disposed of gradually as property is retired from service.

Valuation-based costs were prepared according to section 19a requiring a basic valuation of 1914-16 reproduction costs to be updated with subsequent retirements and with the actual cost of new property acquired and improvements. The cost of reproduction computed in the manner followed in the primary valuation of railroads compared with the original cost of construction, where ascertainable, has been found, in general, approximately the same. *Excess Income of Richmond, F. & P. R. Co.*, 170 I.C.C. 451, 467 (1931). The original valuations were completed in the early 1930's, so that today the principal part of the aggregate costs in the valuation records consists of known actual costs of new property acquired and improvements subsequent to the original valuations and now in use in common carrier service. The inclusion of the valuation-based costs in the primary property accounts "has resulted in a realistic and meaningful statement of cost of common carrier property and money invested therein." *Annual Report, 1964*, p. 55. The Coordinator finds that these costs are the best evidence of the original cost of constructing the Nation's railroads, and that the unsupported items of account 80, though small, should be left out of an original cost, less depreciation, rate base.

The SPC's proposal is incongruous. Account 80 debits are excluded; account 80 credits are included and substracted from the

best copy available

property accounts. The effect of the SPC's suggestion is to recognize writedowns to the valuation basis from historically recorded items, but to ignore writeups to the valuation values. Items of the same nature should be treated alike. The Coordinator rejects the SPC's suggestion.

Modification of accounts 90 and 76.—All parties favor a modification of account 76, Interest During Construction, to include imputed interest on equity funds tied up in new construction. The railroads had originally proposed the account 76 modification as an alternative to recording the amounts in account 90, Construction Work in Progress, in the net investment rate base. The railroads now acquiesce in a proposed account 76 modification alone.

Account 76 is an accounting issue which the Commission has had to deal with on several occasions many years before the advent of Ex Parte No. 271. The Commission first recognized an allowance for interest during construction in account 76 of its classification of accounts for Steam Roads in 1914. The account, which reads much like account 76 for railroads today, included a fourth paragraph as follows:

> This account shall also include reasonable charges for interest, during the construction period before the property becomes available for service, on the carrier's own funds expended for construction purposes.

This system prevailed for the next 27 years.

In 1941, the Commission revoked paragraph four of account 76, leaving only the instruction to capitalize interest on debt capital used to fund construction of road and equipment.

The Coordinator is opposed, in the instant proceeding, to imputing interest on equity funds used for construction. The trend today is recognition of these funds used in construction as a rate base item, and not the imputing of so-called interest on these funds. The Securities and Exchange Commission has under consideration the elimination of this item from the income statement. The Financial Accounting Standards Board is also considering the entire subject.

The Coordinator's opposition is directed at the so-called "phantom profits" that would result from imputing interest on equity funds. The additional income that is created by its recognition is not supported by cash.

Not only would its recognition for normal reporting purposes require a change in the Commission's accounting rules, but more importantly, it would serve to distort the true financial condition of the railroads. Being noncash income, the "phantom profits" would not be available to support potentially higher dividend requirements.

A frequently quoted article in *Business Week* entitled "A Case of Phantom Profits?"[27] illustrates the danger to public utilities of basing dividends on profits which include a noncash credit for capitalized interest. The utility practice of capitalizing interest is sanctioned by many State public utility commissions so that utility earnings will not be depressed by these interest charges (relating to future benefits to the consumer) and, therefore, strengthen the utilities' cases for revenue need in the present. However, when utilities strive to maintain a certain dividend payout they often pay dividends which exceed real earnings. This results in a weakening of their cash position.

Unlike many of the public utilities, however, it is doubtful that "phantom profits" would influence railroad dividend policy very greatly because the railroads generally are not expending large sums of money for new construction projects.

A restatement of financial results for four railroads, two relatively prosperous ones and two poor ones, assuming an imputed interest rate of 8 percent, is set forth in appendix E. A decision to impute interest to equity would have only a minor impact on the railroads' reported earnings and working capital. The extra work and effort appear not to be worthwhile for such a small incentive to new investment. Giving primary weight to the inconsequential nature of the suggested change and the possibility of dividend payments in excess of cash income, the Coordinator rejects the suggestion to impute interest to equity funds tied up in construction.

Working capital allowance.—Two methods of computing working capital have been suggested by the various parties of record. The SPC espouses use of the Commission's Cost and Valuation Section's Rail Form A formula. The railroads favor continued use of the traditional working capital definition—cash on hand plus materials and supplies. The Coordinator supports the SPC's proposal to define working capital for inclusion in the rate base as the lesser of "needed" or actual working capital.

The Coordinator believes the Commission's Cost and Valuation formula is superior to the traditional approach in several ways. First, the formula is a dynamic measure, while the traditional definition is a static one. Working capital needs for day-to-day operations arise only because operating receipts and disbursements occur at different times, the first often following the second. If they always occurred simultaneously, a firm's current assets would more or less equal its current liabilities, with little need for any additional investment in liquid assets. The formula recognizes and more accurately measures the dynamic nature of working capital. In the Coordinator's opinion, the SPC is correct in pointing out that carriers whose working capital investments exceed the formula measurement should not be compensated for their excessive liquidity; and, conversely, carriers with deficient working capital investments should earn a return only on the monies they have actually committed.

---

[27] "A Case of Phantom Profits?" *Business Week* 87 (June 15, 1974).

Second, the formula provides for a "buffer fund allowance" which might be interpreted as a provision for the liquidity needed to reduce a road's deferred maintenance, or provide for other contingencies, a provision which may not be reflected in book value—working capital.

Third, the carriers' actual working capital as of a specific date can be temporarily inflated (*e.g.*, through a strategic timing of material and supply purchases), enabling them to include in the rate base an allowance which exceeds their actual, average needs. This manipulation of the working capital allowance works to the advantage of the railroads and to the disadvantage of ratepayers. The Commission's formula precludes this manner of account manipulation.

A comparison of the Commission's formula to the Federal Power Commission's traditional method leads to the conclusion that the two are similar in principle.[28] While the FPC may allow or disallow certain current account items in contrast to the Commission's formula (due to the different operating characteristics of its regulated companies), it still bases its working capital allowance on timing differences between the provision of service and the receipt of cash in payment for such service.

Finally, the Coordinator concludes that the formula should not be shortened as previously thought. The numerous steps in the formula are necessary to accurately compute the timelags between cash receipts and disbursements and do not represent particularly difficult or time-consuming calculations. The principles underlying the formula should not be comprised in favor of what would only amount to "cosmetic" changes in its appearance.

---

[28] See Paul J. Garfield and W. F. Lovejoy, *Public Utility Economics* 71 (Prentice-Hall, Inc., 1964).

Average v. yearend or beginning of year rate base.—All three methods of timing rate base measurements are appropriate for different purposes at different times. An average is appropriate for an analysis of a years' experience in order to avoid giving undue weight to either beginning or end of year manipulations. A beginning of period base is appropriate in some circumstances, such as for the Commission quarterly reports, due to the processing times required for timely release of quarterly financial data.[29] An end of period base is appropriate in general revenue proceedings to bring actual financial experience down to a date nearest the filing date of the application.

For the purpose of computing rate of return on investment, the SPC used an average of beginning and end of period investment. The Coordinator finds this method acceptable. However, recognizing the reasons for using differing methods, the Coordinator endorses continued use of all three methods of timing rate base measurement.

DISCUSSION AND CONCLUSIONS: RATE OF RETURN

General revenue standards: a history.—As with the brief history of valuation, it is also necessary to sketch a history of general revenue standards and the rules of ratemaking used in general freight rate increase proceedings, before resolving the rate of return and revenue-related issues of record in this proceeding.

1887-1919.—With the passage of the original 1887 "Act to Regulate Commerce" the Commission was charged with insuring that railroad rates were both just to shippers and reasonable to carriers. Until 1903, the Commission applied the standard of justness and reasonableness only in specific rate cases, not in general revenue proceedings dealing with the whole spectrum of freight rates. In 1903, it became known that the railroads planned a series of general increases. The Commission instituted an ex parte investigation to exhaust whatever power it then had over the justness and reasonableness of rates. *Re Proposed Advances in Freight Rates,* 9 I.C.C. 382, 438 (1903). This proceeding was instituted prior to the Hepburn Act of 1906, which gave the Commission the power to fix rates after investigation, and also prior to the Mann-Elkins Act of 1910, which gave the Commission the power to suspend a rate proposal for up to 7 months during an investigation of its lawfulness. The best that the Commission could do in 1903 was merely to threaten to institute proceedings to declare certain rates unjust and unreasonable for whatever weight a court of law would give such a finding.

---

[29] See appendix F for a sample Bureau of Accounts quarterly report for the quarter ended September 30, 1975.

In *Proposed Advances, supra,* 410, the Commission analyzed the railroads as a group and separately by typical railroad, and found in general that the railroads were prosperous. Earnings regulation was conceived in the context of the railroads as a monopoly and the rates charged were seen as a tax on the commerce of the country. *Proposed Advances, supra,* p. 437-8. The Commission also stated at p. 404:

> It is plain that until there be fixed, either by legislative enactment or judicial interpretation, some definite basis for the valuation of railroad property and some limit up to which that property shall be allowed to earn upon that valuation, there can be no exact determination of these questions. In the absence of such a standard the tribunal, whether court or commission, which is called upon to consider this matter can only [rely] upon the whole exercise [of] its best judgment. ***

In 1911 the railroads were still viewed as a monopoly and their rates a tax upon commerce. *Advances in Rates—Eastern Case,* 20 I.C.C. 243, 261-4 (1911) (hereinafter cited as *Eastern* case). The Commission reaffirmed the necessity of judgment in regulating railroad earnings, citing the passage quoted in the next preceding paragraph. To the carriers' contention that the need for additional revenue alone justified the increase, the Commission replied that "strictly speaking" the Commission had no jurisdiction in 1911 to hear and determine such a question. The Commission viewed its authority as being "limited to inquiring into the reasonableness of a particular rate or rates and establishing that rate or practice which is found lawful, in place of the one condemned as unlawful." *Eastern, supra,* 247-8.

The regulatory limitation of particular rates was discussed by the Commission in *Advances in Rates—Western Case,* 20 I.C.C. 307, 347, 348 (1911) (hereinafter cited as *Western* case):

> The legislature may not make rates so as to confiscate the carrier's property. The carrier, on the other hand, may not make rates which are unjust to those who by economic necessity are compelled to employ its services. Here, then, we have the minimum of legislative power and the maximum of the carrier's power. Between these lies a zone, indefinite and variable. Without question the carrier will tend toward the maximum, while governmental authority will be inclined—in fact, has been created—to repress this upward tendency. One moves inevitably upward to the highest rate which the traffic will bear; the other attempts to discover some relation between charge for service and cost of service.

In the *Western* case, the Commission resisted the railroads' attempt to establish the Commission *in loco parentis* of railroad earnings and refused "to become the directing mind in railroad management." *Western* case, *supra,* 317.

The Commission made the following comments on the need for a fair return in the *The Five Per Cent Case,* 31 I.C.C. 351, 359-60 (1914):

> Many railroad investments in this country are exceedingly profitable to their owners. In common justice the investors in such properties are entitled to share in the general prosperity and to enjoy the just rewards of their foresight and wisdom so long as the rates exacted are reasonable. It is not only consistent with a national policy that invites the private ownership of railroads that there should be a liberal return on a particular railroad investment, when the property has been wisely planned and honestly contructed and is efficiently managed; but the full development of that policy, as well as justice, requires that such a return should be made. The public interest demands not only the adequate maintenance of existing railroads, but a constant increase of our transportation facilities to keep pace with the growth and requirements of our commerce. If, however, that development is to be accomplished with private capital, in conformity with our traditions, nothing can be more certain than that the facilities will not be provided except under such a system of regulation as will reasonably permit a fair return on the money invested.
>
> The public owes to the private owners of these properties, when well located and managed, the full opportunity to earn a fair return on the investment; and the carriers owe to the public an efficient service at reasonable rates.***

The Commission also undertook to suggest how the carriers may increase their revenues without resorting to a general advance in their freight rates. Suggestions included, among others, eliminating unremunerative operating practices, such as free time for loading and unloading and various other accessorial services of a similar nature, and greater economies in the use of freight cars. *The Five Per Cent Case, supra,* 406-414. Nevertheless, after an extensive weighing of average unit cost and revenue evidence the Commission approved a portion of the proposed rate increase. The Commission accepted the property investment, as proposed by the carriers, as a rate base for this case, recognizing that the recently approved Valuation Act of 1913 would eventually provide for a more satisfactory base when completed. Since the July 1, 1907 adoption of the Commission's system of accounts, the impact of the carriers' previously imprecise accounting practices had been reduced. *The Five Per Cent Case, supra,* 361. Returns on book value for the 1900-1913 period averaged 5.64 percent. *The Five Per Cent Case, supra,* 367.

1920-1932.—With the passage of the Transportation Act of 1920, the Commission was given affirmative responsibilities for the adequacy of railroad earnings. In commenting on the recapture provisions of its bill, which later became law, the Senate committee indicated in its report:

> Heretofore the regulation of transportation has been regarded merely as a restriction imposed upon particular carriers. For the first time it is proposed to look upon transportation as a subject of national concern and from a national standpoint. It is the duty of the Government so to exercise its power of regulating commerce among the States and with foreign nations that all parts of a common country *shall enjoy adequate transportation facilities at the lowest cost consistent with fairness to the capital invested and to the men who manage and operate these facilities.* The commerce of one community, in these days, is deeply involved in the commerce of every community in the land. All the railways we have, or substantially all, must be maintained; and, from time to time, they must be enlarged and additional facilities must be provided. [Emphasis added.] S. Rep. No. 304, 66th Cong., 1st Sess. (1919), p. 18.

Moreover, in upholding the constitutionality of the recapture provisions, the Supreme Court indicated:

> The new act seeks affirmatively to build up a system of railways prepared to handle promptly all the interstate traffic of the country. It aims to give the owners of the railways an opportunity to earn enough to maintain their properties and equipment in such a sate of efficiency that they can carry well this burden. To achieve this great purpose, it puts the railroad systems of the country more completely than ever under the fostering guardianship and control of the Commission, which is to supervise their issue of securities, their car supply and distribution, their joint use of terminals, their construction of new lines, their abandonment of old lines, and by a proper division of joint rates, and by fixing adequate rates for interstate commerce, and in case of discrimination, for intrastate commerce, to secure a fair return upon the properties of the carriers engaged. *Dayton-Goose Creek Ry.* v. *U.S.*, 263 U.S. 456, 478 (1924).

Thus, the Commission's jurisdiction to consider the adequacy of rail earnings in order to provide adequate service was clearly established, contrary to the earlier *Eastern* and *Western* decisions.

As originally passed, section 15a(2) and (3) read as follows:

> (2) In the exercise of its power to prescribe just and reasonable rates the Commission *shall* initiate, modify, establish or adjust such rates so that carriers as a whole (or as a whole in each of such rate groups or territories as the Commission may from time to time designate) will, under honest, efficient and economical management and reasonable expenditures for maintenance of way, structures and equipment, earn an aggregate annual net railway operating income equal, *as nearly as may be*, to a *fair return* upon the aggregate value of the railway property of such carriers held for and used in the service of transportation: *Provided*, That the Commission shall have reasonable latitude to modify or adjust any particular rate which it may find to be unjust or unreasonable, and to prescribe different rates for different sections of the country.

> (3) The Commission shall from time to time determine and make public what percentage of such aggregate property value constitutes a *fair return* thereon, and such percentage shall be uniform for all rate groups or territories which may be designated by the Commission. In making such determination it shall give due consideration, among other things, to the transportation needs of the country and the necessity (under honest, efficient and economical management of existing transportation facilities) of enlarging such facilities in order to provide the people of the United States with adequate transportation: *Provided*, That during the two years beginning March 1, 1920, the Commission shall take as such fair return a sum equal to 5 1/2 per centum of such aggregate value, *but may, in its discretion, add thereto a sum not exceeding one-half of one per centum* of such aggregate value to make provision in whole or in part for improvements, betterments or equipment, which, according to the accounting system prescribed by the Commission, are chargeable to capital account. [Emphasis added.]

In the first general revenue proceeding subsequent to the passage of the Transportation Act of 1920, the carriers sought to have the Commission use some $20.04 billion in book investment as a rate base. But after considering the elements of value—including its incomplete studies under section 19a, the investment accounts, earning capacity, stock and bond value, going concern value and an allowance for working capital—the Commission selected an $18.9 billion base. *Increased Rates, 1920,* 58 I.C.C. 220, 229 (1920). Rate increases permitted were 40 percent in the East, 35 percent in the West (excluding mountain Pacific), 25 percent in the South and mountain Pacific (page 246), and 33 1/3 percent interritorially (page 247).

In *Reduced Rates, 1922,* 68 I.C.C. 676 (1922), the Commission rolled back substantial portions of the increases authorized in *Increased Rates, 1920, supra.* In doing so, the Commission made the following comments:

> *The operation of economic forces which have prevented, or which may hereafter prevent, carriers from earning a fair return under the adjustment of rates then prevailing does not constitute a bar to determination of what a fair return should be.****
>
> The determination of what will consitiute a fair return under paragraph (3) of section 15a is, in our judgment, a function distinct from that of initiating and adjusting rates under paragraph (2) of that section. Section 15a, reasonably construed, contemplates the determination of a return which the carriers, collectively or in rate groups, may attain over a period of time under rates adjusted from time to time with that object in view. *The phrase "from time to time" does not mean that we should adjust and readjust rates to meet business fluctuations. Whether carriers may be able to earn an aggregate net railway operating income equal to a fair return must depend to a large extent upon business conditions.* *** [Emphasis added.] *Reduced Rates, 1922, supra,* 680.

The Commission recognized that since business conditions determine traffic levels, it might be necessary to adjust rates in the event of a business downturn to insure the free flow of commerce and production of railroad revenues. A more explicit consideration of the movement of traffic, while not then a specified consideration in section 15a, is indicated by the following passage:

> It is our duty to initiate such rates as will enable the carriers to earn as nearly as may be a fair return, qualified as provided in the act. In 1920 we authorized large increases in freight rates and passenger fares designed to produce the necessary revenues under the conditions then prevailing. There was then little doubt of the ability of industry to bear the increased charges. The situation has since changed. The country has been passing through a period of abundant supply and slack demand, in which prices at the source have fallen off sharply. High rates do not necessarily mean high revenues, for, if the public can not or will not ship in normal volume, less revenue may result than from lower rates.
>
> Shippers almost unanimously contend, and many representatives of the carriers agree, that "freight rates are too high and must come down." This indicates that transportation charges have mounted to a point where they are impeding the free flow of commerce and thus tending to defeat the purpose for which they were established, that of producing revenues which would enable the carriers "to provide the people of the United States with adequate transportation."*** *Reduced Rates, 1922, supra,* 732-3.

The Commission stated its role in ratemaking matters under the 1920 section 15a as follows:

> The carriers take the position that we must be guided solely by those things which are definite and certain in the past. With this we can not agree. Our function under the law is not that of mere computers and can not thus be atrophied. *The duty to prescribe rates for the future carries with it the obligation to exercise an informed judgment upon all pertinent facts, present and past, in order to forecast the future as best we may.* In *Rates on Grain, Grain Products, and Hay,* [64 I.C.C. 85 (1921)]. We said at page 99:
>
> *** The duty cast upon us by section 15a is a continuing duty and looks to the future. It does not constitute a guaranty to the carriers, nor is the obligation cumulative. We are not restricted by past or present statistics of operation and earnings. These are serviceable only as they illuminate the future. What is contemplated by the law is that in this exercise of our ratemaking power the result shall reflect our best judgment as to the basis which may reasonably be expected for the future to yield the prescribed return. [Emphasis added.] *Reduced Rates, 1922, supra,* 730.

This is but a reiteration of the policy that informed judgment after a consideration of all relevant facts is the proper role of the Commission, as indicated in the 1911 *Eastern* and *Western* cases. Rate setting for the future has not been solely a mathematical exercise, even under the 1920 section 15a and its associated recapture provisions.

The role of business conditions in the movement of traffic and, hence the impact on rail earnings was even more clearly delineated in *Fifteen Per Cent Case, 1931,* 178 I.C.C. 539 (1931). In 1931, the country was prostrated by the great depression and the railroads were feeling severe pressures from competitive means of transportation. The railroads did not ask for the full fair return they argued was their right as a matter of law, nor did they seek to change the valuation previously assigned to their properties, i.e., the *1920* basis plus subsequent betterments and improvements. The carriers, nevertheless, proceeded to argue that revenue considerations were made superior by the 1920 fair return provisions of section 15a to the just and reasonable standard of section 1(5), a part of the original 1887 act to regulate commerce. The Commission disagreed with the carriers stating:

> We agree that our duty with respect to fixing just and reasonable rates was changed by Congress in the act of 1920, through the provision of a modified standard for our guidance. We agree that there was then introduced into the law a new element of protection for the carriers in the public interest, a protection particularly of the credit essential to the preservation of an adequate national system of transportation. We believe that it is our duty under the congressional mandate to exercise our powers in every reasonable and practicable way to the promotion of that end. We agree, as we did in 1920, that in such a general rate proceeding as this, involving primarily revenue considerations, we can not undertake to consider the justness and reasonableness of individual rates.
>
> But there is more than this to be siad, if our full duty is to be made clear.*** Assuming that the paramount purpose of that section is the provision of adequate revenue for the carriers, it is the *actual revenue result* of a proposed increase in rates which we must have in mind, and not the effect apparent superficially. We understand that in principle the carriers do not dispute this proposition, although they may differ as to how conclusions upon this point are to be reached. Our own view is that we are not justified in approving a rate increase if we are convinced that such increase will not operate to the revenue advantage of the carriers. *Fifteen Per Cent Case, 1931, supra,* 562-3.

The Commission went on to say:

> But section 15a has not, in our opinion, made revenue needs the "paramount and controlling" factor in the determination of a reasonable general level of rates. Factors which theretofore were relevant and entitled to consideration, nothwithstanding the revenue needs of individual carriers, are still relevant and entitled to consideration, notwithstanding the revenue needs of the carriers in the aggregate or by groups. Among those other factors are the following:
>
> 1. *The value of the service to the shipper.—****
>
> 2. *The volume of business carried on by the carriers and its relation to what may be deemed normal.—****

> 3. *The return realized from the freight service alone, as distinguished from other forms of service rendered by the carriers.—****
>
> For the moment we express no opinion as to the weight to be given these particular factors in the present proceeding. That will be considered later. But that they are relevant and material factors which must be given consideration we are persuaded. We are here speaking of the general level of rates, as applied to all traffic, or particular forms of traffic, and not of individual rates. *Fifteen Per Cent Case, 1931, supra,* 564-5.

To confirm the Commission's view of its general ratemaking standards both before and after the new law, the House Report on the bill that became the rule of ratemaking commented:

> *** It is difficult to conceive of a reasonable rate which would ignore any one of these considerations. The Commission as a fair and impartial body acting for the Congress *will continue to give consideration* to *these factors.* In the case of the power given to the Commission to prescribe just and reasonable rates the committee does not believe that it is necessary to encumber the statutes with further language which might be mandatory in terms *but which could add nothing further to the plain duty of the Commission under the law,* and which might be interpreted to imply a distrust of the Commission in prescribing just and reasonble rates. *The Commission will and must give consideration to all facts developed* on the record and see to it that the record is enlightening as to such factors as are mentioned in the first section of this bill. [Emphasis added.] H.R. Rep. No. 193, 73d Cong. 1st Sess. (1933), p. 30.

In the first general revenue proceeding following the enactment of the 1933 rule of ratemaking, the Commission commented on the respective weight to be given the three factors in the new rule:

> The first two factors specified in that section are elements to be considered in determining the value of the service to the shipper. Adequate and efficient railway transportation service is important not only to the public in general but to the shipper in particular. The third factor relates solely to the revenue needs of the carriers. The weight to be given to the respective factors specified in that section depends upon the facts presented. *General Rate Level Investigation, 1933,* 195 I.C.C. 5, 61 (1933).

In the second such proceeding following the 1933 amendment, the Commission had occasion to consider certain shippers' contentions that primary weight was to be accorded to the movement of traffic portion of the new section 15a(2). The Commission indicated that the "broad purpose of and the ultimate responsibilities imposed on us by both the old [1920] and new [1933] section 15a(2) are the same***" *Emergency Freight Charges, 1935,* 208 I.C.C. 4, 26 (1935).

In the *Fifteen Percent Case,* 1937-1938, 226 I.C.C. 41, 77, the Commission gave consideration, among other things, to the legal effect of the Hoch Smith resolution of 1925:

> By the Hoch-Smith resolution, approved January 30, 1925 (U. S. Code, title 49, section 55) it is by Congress "declared to be the true policy of rate making to be pursued by the Interstate Commerce Commission in adjusting freight rates, that the conditions which at any given time prevail in our several industries should be considered insofar as it is legally possible to do so, to the end that commodities may freely move." It is required, in the investigation of the rate structure which under that resolution it was mandatory for us to institute, that in making any "change, adjustment or redistribution," under the provisions of the resolution, we shall "give due regard, among other factors, to the general and comparative levels of market value of the various classes and kinds of commodities as indicated over a reasonable period of years to a natural and proper development of the country as a whole, and to the maintenance of an adequate system of transportation." The requirements so found in the Hoch-Smith resolution are but declaratory as to what our duties have been at all times, in the exercise of the rate-making function, *Ann Arbor R. Co.* v. *United States*, 281 U. S. 658. Ever since general revenue cases began to come to us we have given consideration to matters such as those indicated, so far as they may throw light on the reasonableness and justness of the proposals at issue.

The Transportation Act of 1940 added the national transportation policy to the act, and this policy became a factor in each substantive section of the act. In establishing the national transportation policy, Congress declared its intent "to promote safe, adequate, economical, and efficient service and foster sound economic conditions in transportation and among the several carriers."

The wartime cases were basically national defense cases, in accordance with the national transportation policy. There is a balancing of projected increased expenses and the needed revenues to offset such expenses without much attention being given to valuation or rate of return matters. *Increased Railway Rates, Fares, and Charges, 1942,* 248 I.C.C. 545, 555, 606, and 613 (1942). In 1943, the Commission ordered a postponement for the duration of the war of the previously granted *1942, supra,* increases, recognizing the railroads' wartime prosperity, and apparently giving some weight to wartime price controls. *Increased Railway Rates, Fares, and Charges, 1942, supra,* 255 I.C.C. 357, 391-396 (1943), 256 I.C.C. 502, 505-6 (1943), 258 I.C.C. 455, 458 (1944), and 259 I.C.C. 159, 193 (1944).

1946-1960.—After the war a wave of inflation hit the economy and the railroads. A new factor was added in the first of the post-war cases as the Commission began to consider detailed traffic forecasts and associated projected revenue and expense levels. The first forecast was for the 8 remaining months after the close of the record in April 1946. *Increased Railway Rates, Fares, and Charges, 1946,* 264 I.C.C. 695, 729-37 (1946) (hereinafter cited as *1946*). The Commission indicated:

> In the fixation of rates for the future, necessarily we must determine as best we can the approximate amount of traffic that may be expected, and the revenue, gross and net, which may be derived therefrom. As subsidiary to this, we must consider that the volume that may be expected will be affected somewhat by the level of the rates themselves. Recent experience, knowledge of present conditions, and an intelligent forecast of the reasonably near future, all are pertinent. *1946, supra,* 729-30.

The first forecast was made by the railroads, the second was 3 months' actual experience multiplied by 4, and the third was a rough average of the last prewar year, 1941, and the last war year, 1945, on the assumption that the traffic mix of 157 commodity groups would fall between these two extremes. In the final report in *1946,* 266 I.C.C. 545, 551, a 1-year forecast by the railroads was considered. Three 1-year forecasts for 1948 were presented in the next proceeding, *Increased Freight Rates, 1947,* 270 I.C.C. 403, 418, 419 (1948) (hereinafter cited as *1947*). The railroads estimated some 630 billion ton-miles, the Secretary of Agriculture estimated either 700 or 770 billion ton-miles depending on the industrial production index assumed, and the National Association of Railroad and Utilities Commissioners (now known as the National Association of Regulatory Utility Commissioners or NARUC) estimated either some 649 billion or 681 billion ton-miles at two different times on the *1947* record. After consideration of all views, the Commission chose some 647 billion ton-miles for its "constructive normal year." The ton-mile forecast was translated into operating expense levels and, then, projected increases in expenses were extensively analyzed. The Commission found a 5.70 percent rate of return on a base composed of original cost less accrued book depreciation, plus the present value of land and rights. The reproduction cost estimates were not given much weight because they were so far in excess of original cost due to the strong inflationary impact of post-war price levels on the reproduction estimates. *1947, supra,* 436. The Commission authorized 20- to 30-percent increases in rates depending on the territory.

A 1-year future estimate of some 640 billion ton-miles for 1949 was projected by the Commission in *Increased Freight Rates, 1948,* 272 I.C.C. 695, 709 (1948). The Commission was conscious of the speculative nature of such estimates and the dependence of such estimates upon business conditions and strikes. Six months later (half way through 1949) this estimate was reduced to some 575 billion ton-miles due to a "mild recession." *Increased Freight Rates, 1948,* 276 I.C.C. 9, 18-19 (1949). The Commission made the following comments on the difficulties of forecasting ton-miles by commodity in 1949:

> The difficulties of making a practical forecast of traffic are illustrated by the current contrary tendencies in two important groups of commodities: Agricultural products, and bituminous coal. As to the first, there are recited present, but necessarily not certainly to be realized, prospects of great crops of some of the most important products of agriculture; the current and recent weather conditions in other areas have made it more than likely that the tonnage of the last preceding year will not be equalled. In the bituminous coal industry there is a curtailment of production for the stated purpose of "stabilizing" production which might otherwise be increased. Obviously the uncertainties surrounding the movement of these great groups of commodities even in the very near future, make the always difficult task of forecasting one that is at the moment unusually speculative. Examples might be multiplied. *Increased Freight Rates, 1948, supra,* 43.

In *Increased Freight Rates, 1948, supra,* 44, the Commission recognized the relationship of transportation prices to prices generally in the context of economic forecasts. The Commission determined that while:

> Economists attach much importance to this dispersion of prices in their efforts to explain and foresee business conditions. Railroad freight charges, though an important member of the family of prices, are prices for services, and they cannot reflect the effects of all price-making influences ***.

In *Increased Freight Rates, 1951,* 284 I.C.C. 589, 600 (1952) (hereinafter cited as *1951*), the Commission was able to say that there were no significant differences in the ton-mile forecasts among the normally conflicting economic witnesses of the railroads, Government agencies, NARUC, and certain shipper groups. The Commission then proceeded to a financial analysis of the railroads' condition. Considered were the "relation of profit to revenue" ((1) net railway operating income, or (2) net income divided by total operating revenues), fixed charge coverage (at least $2 of net railway operating income for every dollar of fixed charges "as a rough but serviceable rule of thumb"), and rates of return, nationally, by regions and by individual railroad. Nationally, the estimates of projected rates of return under the proposed increase range from 4.95 to 5.16 percent on the proposed elements of value rate base. *1951, supra,* 607. The Commission characterized such returns as follows:

> Judged by any standard shown of record, the rates of return earned or prospectively to be earned by the railroads by the districts and regions specified in our former reports in this case, are substandard. Some important roads are earning little enough that a continuance of the earnings situation will imperil their solvency, while some are in comfortable condition. Neither the strongest nor the weakest lines can control the rate adjustment; and as has been shown, the great body of the rail carriers are in the middle class, with aggregate earnings that for the immediate future must be considered as substandard, and inadequate. *1951, supra,* 612.

The Commission went on in its financial analysis to consider the credit position of the railroads. The Commission found that capital expenditures doubled on the average for each of the years 1948-1951 over the years 1945 and 1946. Financing, except for equipment obligations, was exclusively from internal sources. External financing in the form of stock sales was conspicuous by its absence. Return on shareholders' equity (called "rate of earning on capital stock")[30] averaged 7.66 percent in the period 1941 to 1950. In 1950, the figure was 9.09 percent. The 1951 rate of return on shareholders' equity was 8.78 percent.

One of the opponents to the rate increase did a funds flow analysis finding that funds available exceeded the funds required. Funds available for this purpose consisted of net income and depreciation charges, including amortization and retirements. Funds required were defined as including installment payments on equipment obligations, cash payments on gross capital expenditures, sinking and other reserve funds and cash dividends. *Increased Freight Rates, 1951, supra,* 624, 625. Such a definition failed to include the increase in working capital over the witness' selected 1939-51 period, failed to allow for voluntary debt reductions during the period, and, finally, assumed that *required* funds equaled funds actually needed. Based on this definition of funds required, it was assumed that cash dividend yields and the 1951 inventory of materials and supplies were adequate. The change in the dollar's value from 1939 to 1951 made it unlikely that equal dollar amounts of materials and supplies are in fact equal in physical units purchased. It was also pointed out that past excesses of funds available are often invested in physical plant and are thus not available for present funds deficiencies.

In 1956, the Commission emphasized "the conflicting contentions cannot be resolved with mathematical precision. The situation calls for the exercise of informed judgment based upon the most careful study." *Increased Freight Rates, E. and W. Territories, 1956,* 299 I.C.C. 429, 437 (1956), 299 I.C.C. 557, 562 (1957); and *Increased Freight Rates, E., W., and S. Territories, 1956,* 300 I.C.C. 633 (1957). In the final report, after extensively analyzing increased expenses, the financial condition of the carriers, and the potential diversion or decline in traffic, the Commission authorized a general 12-percent increase, except 14 percent on eastern commodity and exception-rated traffic and 9 percent for the south and Pocahontas lines and between them and the rest of the country, subject to numerous specific holddowns.

---

[30] The ratio of total net income after taxes to the total capital stock, both common and preferred, the stock being taken at part for par value shares and at book value for no-par stock.

The Commission then commented on the role of rate of return:

> In ***, *North Carolina* v. *United States (1945)*, 325 U. S. 507, 515, the Court in footnote 4 again commented on the effect of the rule of ratemaking as follows:
>
> But Congress in 1933, 48 Stat. 211, repealed this part of the 1920 Act; the income pooling system was abandoned; the rule of [rate] making was rewritten, and while the Commission was to give consideration to the need of adequate and efficient railway transportation service at the lowest cost consistent with the furnishing of such service, and to the need of revenue sufficient to enable the carriers under honest, economical and efficient management to provide such service, the rates were no longer to be treated on a national basis as though all railroads constitute one system. House Report No. 193, 73rd Cong., 1st Sess., pp. 30-31. Railroads were to be treated on an individual basis. Abandonment of the profit pooling system made this necessary to carry out the continuing Congressional purpose to prevent "an unreasonably large return upon the value of their properties." The Commission recognized this legislative change in rate-making policies by its reference to "revenues required to enable respondents to render adequate and efficient transportation service." The "respondents" referred to were the individual railroads to which North Carolina's order applied.
>
> We do not construe these decisions as requiring us to prescribe reasonable rates for individual railroads, because individual railroads must compete with each other for traffic. However, it is clear that there is no statutory requirement or statement of policy requiring the making of rates to yield a certain rate of return on investment either in the United States as a whole, or in various rate territories. 300 I.C.C. 633, 662.

Having considered the financial condition and the revenue needs of the railroads necessary to provide adequate and efficient service, the Commission then turned to evidence as to the projected effect of increased rates on the movement of traffic, and to the need in the public interest of adequate and efficient railway transportation service at the lowest cost consistent with the furnishing of such service. The Commission commented in conclusion:

> We estimate that all railroads subject to our jurisdiction will be compensated approximately to the extent of their known increased costs, and that the eastern and western railroads will obtain some additional revenues over and above such costs. Such additional revenues should help them in carrying forward their plans for needed capital improvement and modernization. We are convinced, however, that the full increase in freight rates sought by them would tend to defeat this objective. We believe that the railroads must look primarily to technological advances in the art of railroading to achieve greater efficiency and improved service as the major hope for increasing their rates of return. 300 I.C.C. 686-7.

Ex Parte No. 212, *Increased Freight Rates, 1958*, 302 I.C.C. 665 (1958), and 304 I.C.C. 289 (1958), was a selectively applied general increase designed to recover part of the railroads' increased costs in a recession year. *Increased Freight Rates, 1960*, 311 I.C.C. 373 (1960), was also a selective general increase. From 1958 to 1967 was, in general, an era of relatively small increases in unit costs and a period during which rail traffic increased at the rate of 6 percent a year See *Increased Freight Rates, 1967*, 329 I.C.C. 854, 866 (1967) (hereinafter cited as *1967*).

1961-present.—During this period the railroads filed numerous general rate increases to offset increased expenditures. In the majority of these situations the resulting authorized rate levels did not provide an adequate rate of return.

In *Increased Freight Rates, 1968*, 332 I.C.C. 590, 602-3 (1968), after evaluating expected increased expenses compared with proposed increased revenues, the Commission briefly turned to rate of return and net investment and observed:

> In keeping with their practice in prior general revenue proceedings, respondents submitted an orthodox cost-of-capital study through a qualified expert witness, who concluded that, on respondents' net investment as determined by the Commission, a reasonable rate of return would be 9 or 9 1/2 percent. It being apparent that respondents could not possibly achieve such a rate of return at the level of rates here proposed, the presiding examiner inquired whether the recommended rate of return was not, for all practical purposes in this proceeding, an academic concept. The answer, quoted in part in one of the briefs, was as follows:
>
> Well, I would say it is with reference to your need for computing the total revenues that you think the railroads ought to have. In that sense it is.
>
> But it is not an academic concept for the purpose of comparing what the railroads are actually earning compared to what would be fair in making your determination whether any given set of rates is fair and reasonable.

The Commission also considered whether the proposed rates would be so unreasonably high as to be self-defeating in the context of the first factor in the rule of ratemaking requiring consideration of traffic movement. The Commission agreed with the judgment of the railroads' traffic officers that the contemplated rate level would have no material adverse effect on the movement of traffic and that "the proposed rate level, generally speaking, is within the zone of reasonableness, where management is accorded substantial freedom in service pricing." *1968, supra*, 608.

In addition to the usual increased expense/projected additional revenue analysis and the review of various financial indicators, *1970 and 1971, supra*, 158, the Commission considered various noncarrier affiliate transactions with carriers and concluded that as a whole the Nation's railroads received from noncarrier affiliates some $131 million more than was paid out by the railroads to such affiliates. The Commission appeared greatly concerned over a September 30, 1970, net working capital deficit of some $315.6 million. The Commission was quite aware that the railroads had been asking for rate increases merely to offset in part increased expenses, not to rectify their fundamental financial condition. *1970 and 1971, supra,* 161-163. The Commission again noted the inadequacy of rates of return less than 4 percent and indicated that rate of return on net investment as currently defined may be used "as one of the measures of the respondents' financial condition and revenue need." *1970 and 1971, supra,* 163-165. Returns to shareholders' equity were also shown as a national group for 1969 as 4.0 percent and 1.0 percent (if fixed charges are included as a cost item). By contrast, other industries ranging from public utilities to common carrier trucking in the 1969 First National City Bank compilation show such returns ranging from 10.7 to 14.9 percent.

Because of persistent doubts of the validity of net investment as a rate base, the Commission announced in Ex Parte Nos. 265/267 the institution of Ex Parte No. 271 to determine rate base for the future without the hindrance of statutory deadlines requiring expedited action in general revenue increase proceedings.

The Commission concluded that the increases authorized between 1967 and 1971 were not sufficient to permit the railroads to meet the additional expenses of operation. *1970 and 1971, supra,* 170. The Commission further concluded that the Ex Parte No. 265 increases would aid the carriers in "attempting to provide adequate and efficient railway transportation service, but that the revenues therefrom will not be sufficient to enable the carriers to provide such adequate and efficient transportation service as is contemplated by the Interstate Commerce Act and the national transportation policy as essential to the commerce of the Nation and the national defense." *1970 and 1971, supra,* 179. Nevertheless, the Commission indicated that the funds needed to support service improvements "are not necessarily to be obtained directly from increases in rates and charges to be paid by the shipping public." From the ASTRO report, the railroads projected a needed $3.1 billion a year on the average to 1980 for capital improvements. But the Commission indicated:

> Several protestants have challenged the basis of calculation used in arriving at the above totals and some have demanded that the respondents, or the Commission,

> produce certain additional data said to be necessary to its evaluation. Projections of revenues and cash flow over the decade have been sought, as well as estimates of increases in profits arising from the improvements resulting from the additional investments. *We think that neither the projections of desirable future capital investments, nor the countervailing factors mentioned by the protestants, can control our decision in this case.* The development of capital for investments of the type recommended in this report remains the function of management and is not a measure of the reasonableness of rate levels. It is to be hoped that the earning capacity of the carriers will be such as to enable them to command adequate investment money on either a debt or equity basis. That capacity, however, has reference to their individual management and concerns a problem distinct from the lawfulness of their rates. Many of the problems they face cannot be solved by the payers of freight rates alone, and should not be required of them. *1970 and 1971, supra,* 180-1. [Emphasis added.]

The Commission also made the following observations on rate of return:

> In our earlier discussion herein we have referred to the rates of return obtained by the respondents measured both on the base of their net investment and on shareholders' equity or net worth. We have pointed out in past cases that there is no requirement in law that increases be granted for the purpose of improving carriers' rates of return as such. See *Increased Freight Rates, E., W., and S. Territories, 1956,* 300 I.C.C. 633. At the same time, however, there is no warrant for ignoring these rates of return as significant measures of the financial health of the carriers and of their relative standing in the money markets when evaluating their capacity to obtain funds for necessary improvements.
>
> We have not attempted to prescribe that rate of return on net investment which would be considered an upper limit, but we have observed that a rate as low as 4 percent is inadequate. Over 50 years ago, when the cost of hiring money was more reasonable and its purchasing power much greater, the Congress indicated that returns up to 6 percent were not unreasonable. We believe that appreciably higher returns could not be held unreasonable under economic conditions now prevailing. Interest costs on money borrowed to finance improvements are as high as 9 percent. Return on net worth of other industry groups ranged from 5 percent to over 21 percent in 1969, with total public utilities enjoying a return of 10.7 percent. A basic level of net earnings is essential if funds are to be available for investment in modern facilities and equipment to meet the demands of an expanding economy. A reasonable earning capacity and a respectable dividend record are both essential to raise equity funds. The ability to borrow on reasonable terms requires financial stability. *1970 and 1971, supra,* 181.

The Commission also said that the carriers "must make every effort to attain" a return of 6 percent on net investment or 8 percent on shareholders' equity in order to provide improved services in the future. These were not to be taken as maxima, in any event. *1970 and 1971, supra,* 182. Competitive forces have barred the carriers from attaining that goal, however. Additionally, the Commission recognized that authorized revenue increases are inadequate to meet increased costs facing the railroads. For example, in Ex Parte

No. 303, *infra,* the railroads showed annual adjusted cost increases amounting to $705.5 million; the Commission estimated the authorized increase to yield approximately $586.7 million or a revenue shortfall of $118.8 million. Although additional funds were needed by the railroads, the rate increases necessary to provide the necessary funds could not be taken because of the resulting diversion of traffic that would occur.

In Ex Parte No. 281, *Increased Freight Rates and Charges, 1972,* 341 I.C.C. 288, 303 (1972) (hereinafter cited as *1972*), the Commission focused on (1) working capital and maturing debt, (2) equipment obligations, (3) interest charges and equipment rents, (4) capital expenditures and cash flow, (5) net earnings and rate of return, and (6) margin of earnings. Similar analyses were made in Ex Parte No. 295, *Increased Freight Rates and Charges, 1973,* 344 I.C.C. 589 (1973) (hereinafter cited as *1973*), Ex Parte No. 303, *Increased Freight Rates and Charges, 1974,* 349 I.C.C. 862 (1975) (hereinafter cited as *1974*), and Ex Parte No. 310, *Increased Freight Rates and Charges, 1975,* 349 I.C.C. 555 (1975), as modified, *Increased Frt. Rates and Charges, 1975, Nationwide,* 351 I.C.C. 220 (1975) (hereinafter cited as *1975*).

Considering the adequacy of working capital and the ability to service maturing debt, the Commission in Ex Parte No. 281 found that, as of December 31, 1971, the railroads as a whole had net working capital or current assets minus current liabilities, of $15 million compared with $109 million on December 31, 1970, and $636 million on December 31, 1965. By territory, the railroads had the following net working capital and long-term debt due within 1 year:

	Net working capital	Long-term debt due within 1 year
	millions	*millions*
Eastern district	($104.5)	$219.1
Southern district	90.7	162.3
Western district	28.9	249.4

Large working capital deficits for all three districts would be shown if long-term debts due within 1 year were included in net working capital as is generally the practice outside the surface transportation industry. The Commission believed "the foregoing statistics reflect a situation which cannot be lightly regarded in terms of the railroads' overall liquidity position and capacity to maintain orderly operations." *1972, supra,* 304. The eastern district net working capital deficits were caused primarily by the Erie Lackawanna ($23.7 million), Pennsylvania-Reading Seashore lines ($8.5 million), Reading ($7.6 million), and Penn Central ($53.7 million). These four lines amount to almost 90 percent of the eastern net working capital deficit. The Chessie and N&W, by contrast, are healthy eastern carriers.

In Ex Parte No. 295 the Commission examined net working capital and long-term debt, as of December 31, 1972, in a table as follows:

	Net working capital	Long-term debt within 1 year
	millions	*millions*
United States	$21.1	$623.4
Eastern district	(107.8)	235.4
Southern district	66.6	140.5
Western district	62.3	247.4

The $21.1 million United States net working capital compares with the 1965-1969 average of $319.7 million and the 1960-1964 average of $658.8 million. In 1958, the Senate Committee on Interstate and Foreign Commerce referred to "the minimum safe net working capital necessary for railroads" of $600 million in an era when long-term debt maturing within a year was only $394 million, compared with $623.4 million needed by the end of 1972. *1973, supra,* 608-9. Sen. Rep. No. 1647, 85th Cong., 2d Sess. 7 (1958).

The current ratio is also a measure of liquidity. It is defined as the total current assets including materials and supplies, divided by total current liabilities. The current ratio for 1966-72 is shown below:

District	Year						
	1972	1971	1970	1969	1968	1967	1966
United States	1.18	1.19	1.23	1.20	1.25	1.33	1.43
Eastern district	1.06	1.08	1.14	1.06	1.05	1.17	1.30
Southern district	1.33	1.39	1.38	1.48	1.42	1.38	1.37
Western district	1.25	1.22	1.25	1.24	1.40	1.48	1.57

The largest current ratio declines occurred in the East and West with only a minor deterioration in the South. *1973, supra,* 609.

In Ex Parte No. 303, the Commission noted that net United States working capital amounted to $96.5 million as of September 30, 1973, and long-term debt due within 1 year amounted to $630.2 million. Working capital was still nowhere near the $600 million minimum. In Ex Parte No. 310, net working capital was recorded at $117.2 million as of June 30, 1974.

The Commission found in Ex Parte No. 281 a twofold increase in equipment obligations in the 1960-70 period, from $2.69 billion to $4.4 billion. Average interest rates almost doubled as well over the same period, from 4.6 percent to 8.8 percent. A similar pattern was shown in Ex Parte No. 295. The Commission further noted in Ex Parte No. 295 that equipment leasing had become a major factor in the rapid acceleration of total interest charges and equipment rents. Such charges more than doubled from $688.7 million in 1960 to $1.415 billion in 1972. The ratio of long-term debt to debt plus equity increased (slight decrease in South) as follows:

District	Year	
	1966	1971
United States	36.3	40.1
Eastern district	42.8	53.6
Southern district	37.1	36.7
Western district	31.1	33.9

1973, supra, 611.

Fixed and contingent charge coverage declined from 1966 which was considered a relatively good earnings year by the railroads, but still not as good as the last year so characterized by the Commission, 1955. Such coverages are defined as income available for fixed charges divided by fixed and contingent charges and are shown in the table below:

District	Year		
	1966	1969	1972
United States	2.95	1.93	1.79
Eastern district	2.29	1.08	0.45
Southern district	2.83	2.46	2.76
Western district	3.88	2.88	2.97

Such data are evidence of the severe financial pressures on the railroads. *1973, supra,* 612. In Ex Parte No. 310, fixed charge coverage for the railroads as a group had declined further to 2.06 in 1973, from 4.24 in 1955. The increasing inability to safely cover debt service costs has caused a downgrading of railroad securities by bond rating agencies which, in turn, results in higher borrowing costs.

Considering capital expenditures and cash flow, the Commission concluded in Ex Parte No. 281 that the railroads' capital needs for replacement and modernization have been far greater than their ability to acquire new capital, either from external or internal sources. In every year between 1962 and 1971 capital expenditures have exceeded cash flow from operations by considerable amounts. Borrowing has been essential to meet capital needs, but borrowing is limited by failure to substantially improve earnings. Deficiencies in service are likely in the absence of adequate capital to purchase new equipment and facilities. *1972, supra,* 305. In Ex Parte No. 295, the Commission found in the 1963-72 period that railroad capital expenditures of $14 billion exceeded cash flow by $5.2 billion. Railroad future capital estimates of $32.9 billion for the 1971-80 period and DOT estimates of $31.2 billion for the same period were also considered. The Commission agreed with several shippers that the shipping public should not be expected to finance all capital expenditures. Funds to improve plant are not necessarily to come from rates and charges. However, to the extent money must be borrowed to finance future improvements and to meet the public need for an effective rail transportation system, the credit level of the railroads must be sustained by adequate earnings. The increase authorized in Ex Parte No. 295 fell short of meeting increased operating costs; it merely was designed to prevent the further deterioration in earnings that would have occurred without the rate increase.

To certain shipper contentions that dividends could have aided the cash flow available for capital improvements, the Commission found that even when dividends are added to 1963-72 cash flow that capital expenditures still exceed funds available by $600 million. The 1963-72 annual average capital outlay of some $1.3 billion falls far short of the $3 billion plus average annual capital expenditure rate projected as needed in the 1971-80 period by the railroads and DOT. *1973, supra,* 610-11. In Ex Parte No. 310, the Commission commented:

> Due to the capital-intensive nature of the rail industry large inputs of capital funds are required. External estimates of $3-4 billion annually over a 10-year period, are two to three times the industry's capacity. A primary result of an inadequate cash flow, averaging about $1.3 billion annually, has been the acknowledged accumulation of deferred maintenance and delayed capital expenditures, as of June 30, 1974, totaling in excess of $7.2 billion *** *1973,* 349 I.C.C. 555, 573.

Turning to net earnings and rates of return on net investment and on shareholders' equity, the Commission noted in Ex Parte No. 281 that the net railway operating income increased from a "critically low level" of $486 million in 1970 to $698 million in 1971, attributable to Ex Parte Nos. 265/267 rate increases. This level of NROI is still below that of the last good year, 1966, of $1.05 billion. The railroads' 1.3-percent return on shareholders' equity for 1970 ranked 69th in a list of 70 industries published by the First National City Bank. The Commission concluded that the interim surcharge permitted in Ex Parte No. 281 "hardly scratches the surface in terms of developing a level of railroad profitability that will permit the kind of return on capital enjoyed in other sectors of the economy." *1972, supra,* 306. Considering the projected expenses and revenues, the Commission expected the railroads to achieve a 1.1 percent rate of return on net investment nationally, with a 4.0 percent rate in the South, 4.9 percent in the West, and a negative 3.4 percent in the East. To achieve 6 and 8 percent returns on net investment, rate increases, respectively, of 15.8 percent and 24.1 percent nationally would be required. Additional dollars necessary would be, respectively, $1.556 billion and $2.366 billion. The East would not achieve a 6-percent return in such a scenario, while the South and West would achieve excess returns. Necessary rate increases by district to mitigate this result in percentage terms would be East, 25.1 percent; South, 10.8 percent; and West, 10.0 percent.

To achieve 8, 10, and 12 percent returns to shareholders' equity, the following respective percentage increases would be required: 18.6 percent, 23.5 percent, and 28.4 percent; and in dollars, $1.833 billion, $2.313 billion, and $2.793 billion, respectively. To provide an 8-percent return on shareholders' equity by district would require the following percentage increases: East, 27.0 percent; South, 14.6percent, and West, 13.2 percent. It was estimated that an 8-percent return on equity would produce a 6.7-percent return on net investment; a 10-percent return on equity resulting in a 7.9-percent return on net investment; and 12 percent resulting in 9 percent. *1972, supra,* 306-8. The railroads seek in Ex Parte No. 271, 10 percent on net investment, embracing a 14-percent return on common equity.

In all recent general rate increase proceedings, the railroads were further faced with the problem of potential traffic diversion. Railroad management, as well as the Commission, recognizes that certain exceptions and holddowns are necessary to avoid significant diversion of traffic that would result from application of general rate increases. Moreover, railroad management must keep careful track of traffic movements so that if significant diversion occurs, corrective action in the form of rate adjustments can be taken. Unless this form of corrective action is taken, authorized general increases will prove self-defeating to the railroads.

The earnings margin or percentage of revenues carried down to net railway operating income after fixed charges fell from 5.5 percent in 1966 to 0.5 percent in 1971, as noted in Ex Parte No. 281. In Ex Parte No. 295, the NROI rose to $835 million in 1972, up from $486 million and $695 million in 1970 and 1971, respectively, still below the $1.05 billion of 1966. *Ex Parte No. 295, supra,* 612. The earnings margin in 1972 was still characterized as marginal at 1.5 percent. The lesser revenue needs of the South and West were given weight in determining the maximum percentage increases authorized for those districts. In 1972, returns to net investment were: nationally, 2.95 percent; East, 0.44 percent; South, 5.17 percent; and West, 4.19 percent. For first quarter 1973, these figures had increased slightly to 3.10 percent, 0.56 percent, 5.14 percent, and 4.42 percent, respectively.

In Ex Parte No. 310, the earnings margin ratio, or ratio of NROI less fixed and contingent charges to operating revenues, declined from 7.1 percent in 1955 and 5.1 percent in 1966 to 1.4 percent for the 12 months ended June 30, 1974. For the calendar year 1974, the earnings margin ratio was not expected to change from the abnormally low 1.4 percent. Returns on net investment "remained depressed." The average weighted cost of long-term debt exceeded the average net return on investment of 3.71 percent before deferred Federal income taxes. Return on shareholders' equity remained far below other industrial groups, even considering the most profitable district, the South, separately. For the 12 months ended June 30, 1974 (before deferred taxes), return on shareholders' equity averaged 3.97 percent, down from the 5.03 percent recorded in 1966. Such low returns to investors have lessened the industry's ability to tap the capital market for equity financing to meet capital needs and places an even greater burden on its already inadequate cash flow. *1975*, 349 I.C.C. 555, 572-74.

The Commission also recognized the impact of inflation on reported net income by making the following restatement of net income in 1955 dollars:

	Implicit price deflator for total GNP (1955-100)	Net income	Net income required to equal purchasing power of 1955 net
		Millions	*Millions*
1955	100.0	$927.1	927.1
1960	113.68	444.6	1,053.9
1966	125.40	903.8	1,162.6
1970	148.84	226.6	1,379.9
1973	169.83	558.8	1,574.5
1974[1]	177.61	638.4	1,646.6

[1] 12 months ended June 30, 1974.

The $638.4 million reported net income for a year ended June 30, 1974, amounted to less than 40 percent of $1.647 billion in an equivalent amount of 1955 dollars of purchasing power. *1975*, 349 I.C.C. 555, 573.

This lengthy survey of the rule of ratemaking and other general revenue standards and criteria is designed to show the increasing depth of the Commission's analysis of the carriers' financial condition. Rate of return on net investment, the earning standard at issue in Ex Parte No. 271, has never been used as a sole criterion of revenue need. It has always been supplemented by the many financial criteria indicated. However, regardless of the financial criteria used, the seriousness of the plight of the railroad industry is obvious. Return on net investment is merely one of the many criteria that can be applied. In resolving the net investment rate base and rate of return issues of record in Ex Parte No. 271 it is well to keep rate of return on net investment in proper perspective with all the other financial measures that can be, and are, used to measure revenue need. The Commission's projected cash and funds flow methodologies, as outlined in another section of this report, is a valuable tool that can be used to assist the Commission in assessing railroad revenue need.

Railroad Revitalization and Regulatory Reform Act of 1976.—The concept of revenue need under the 1933 rule of ratemaking has been modified by the 1976 amendments to the act. Section 205 of the new law, P.L. 94-210, effective February 5, 1976, reads as follows:

> ADEQUATE REVENUE LEVELS
>
> Sec. 205. Section 15a of the Interstate Commerce Act (49 U.S.C. 15a) is amended—
>
> (1) by adding at the end of paragraph (2) and at the end of paragraph (3) the following new sentence: "This paragraph shall not apply to common carriers by railroad subject to this part."; and
>
> (2) by redesignating paragraph (4) as paragraph (6), and by inserting immediately after paragraph (3) the following new paragraph:
>
> "(4) With respect to common carriers by railroad, the Commission shall, within 24 months after the date of enactment of this paragraph, after notice and an opportunity for a hearing, develop and promulgate (and thereafter revise and maintain) reasonable standards and procedures for the establishment of revenue levels adequate under honest, economical, and efficient management to cover total operating expenses, including depreciation and obsolescence, plus a fair, reasonable, and economic profit or return (or both) on capital employed in the business. Such revenue levels should (a) provide a flow of net income plus depreciation adequate to support prudent capital outlays, assure the repayment of a reasonable level of debt, permit the raising of needed equity capital, and cover the effects of inflation, and (b) insure retention and attraction of capital in amounts adequate to provide a sound transportation system in the United States. The Commission shall make an adequate and continuing effort to assist such carriers in attaining such revenue levels. No rate of a common carrier by railroad shall be held up to a particular level to protect the traffic of any other carrier or mode of transportation, unless the Commission finds that such rate reduces or would reduce the going concern value of the carrier charging the rate."

The concept of forecasting revenue and expense levels as required by the 1976 amendment to the act is not new to the Commission. Beginning with *Increased Railway Rates, Fares, and Charges, 1946, supra,* the Commission analyzed detailed traffic forecasts in an attempt to ascertain related revenues and expenses to better determine whether the proposed increases were just and reasonable. In the course of recent general rate increase proceedings, the Commission has employed projection of revenue and expense levels to ascertain specific rates of return and to determine whether the railroads were entitled to the sought after rate increases. See *Ex Parte No. 310, supra,* 562-574, *Ex Parte No. 295, supra,* and *Ex Parte No. 281, supra.* The Commission, however, recognized that additional revenue gained as a result of the authorized increases would merely offset incurred costs and would not in itself provide acceptable rates of return. For a detailed discussion of the Commission's experience with forecasting prior to this proceeding see *General Revenue Standards: A History, infra.*

The funds flow work as well as other matters discussed in this proceeding may provide a basis acceptable to the Commission for the new proceeding in meeting the new section 15a(4) criteria.

Rate of return in Ex Parte No. 271.—The parties' estimates of a reasonable rate of return on net investment range from about 4.5 percent to 10 percent. The Special Projects Staff has, however, made concessions on brief substantially weakening the 4.5-percent figure. The 2.52-percent roadway return and, indeed, the road versus equipment return concept itself have been abandoned by the Special Projects Staff. The remaining rate of return/cost of capital evidence is that provided by rail witness Foster and GMI witness Nelson, and in the GSA and NITL commentaries. Such evidence ranges from 8 to 10-percent return on net investment. Specific cost of capital studies for four major railroads show a range of 10 to 12 percent on a basis similar to that of Foster's more general study. Nelson and GMI have no objection to Foster's general conclusions. GSA advocates an 8-percent target rate of return based on 1972 public utility cases; however, this assertion is not supported by any probative evidence. NITL did not arrive at a specific number, but did subscribe to the rate of return/cost of capital criteria applied by Foster.

This Commission has for many years recognized that earned rates of return of less than 4 percent have been substandard and inadequate.[31] Present earned rate of return levels have been characterized as depressed.[32] Rate of return goals of 6 percent on net investment and 8 percent on shareholders' equity have recently been recognized as rates of return the railroads "must make every effort to attain if they are to be in a position to provide the improved services which will be needed in the future."[33]

General revenue increases will not, in the Coordinator's opinion, do the fundamental job of increasing the railroad industry's earned rates of return. The Commission has previously indicated it believes that "*** the railroads must look primarily to technological advances in the art of railroading to achieve greater efficiency and improved service as the major hope for increasing their rates of return.[34] A 10-percent return is in no way to be regarded as a maximum for an individual railroad. There are, for example, several relatively small class I railroads earning in excess of 10 percent as of September 30, 1975.[35] Funds to achieve the range of permissible return will largely have to come from sources other than the freight rate structure.

---

[31] *Increased Freight Rates and Charges, 1973,* 344 I.C.C. 589, 614 (1973); *Increased Freight Rates, 1970 and 1971, supra; Increased Freight Rates, 1968, supra;* and *Increased Freight Rates, 1967,* 329 I.C.C. 854, 870-72 (1967).

[32] *Increased Freight Rates and Charges, 1975,* 349 I.C.C. 555, 567, 573 (1975), where the following rates of return on net investment were shown to have been earned for a year ended September 30, 1974: (1) after deferred taxes, 0.84 percent, East; 5.16 percent, South; 4.00 percent, West; and 3.05 percent, United States; and (2) before deferred taxes, 1.26 percent, East; 6.06 percent, South; 4.75 percent, West; and 3.71 percent, United States. Earnings data published by the Bureau of Accounts for the same period are set forth in appendix F.

[33] *Increased Freight Rates, 1970 and 1971, supra,* 182.

The Coordinator believes that under present conditions the railroad industry should strive for a rate of return of between 6 and 10 percent on net investment to attract capital, improve service, and perform necessary research and development. Such a rate of return should be viewed as neither a floor nor a ceiling. The Coordinator is not attempting to establish a zone of reasonableness for net investment rate of return. There are many factors which might warrant a higher or lower rate of return in the future. For example, if the efficiency of rail service is greatly improved, a return of greater than 10 percent may be appropriate. The 6- to 10-percent target rate of return should be a goal which the railroad industry should work toward under present day circumstances, but no Government guarantee should either be promised or expected. Should the railroad industry achieve this goal, it would be the hope of the Coordinator that the railroad industry would not rest on its laurels and would, on its own, establish new goals, not only as to rate of return but also regarding improved public service.

The Coordinator recognizes that a target rate of return will not be realized through rate structure adjustments only. In Ex Parte No. 313, the railroads calculated that an additional $5.8 billion annually, in addition to an existing $16.5 billion (1974) in freight operating revenues, would be necessary to theoretically achieve a 10-percent rate of return. It is strongly doubted that the market for railway service could sustain such a 35-percent rate increase, even if the Commission were to find such a massive increase just and reasonable and otherwise lawful under the act as amended. History is replete with railroad efforts to solve their earnings problems by massive increases in rates to achieve fair rates of return—and the failure of such efforts. Methods other than general revenue increases must be found to attract sufficient capital to railroading in order to provide adequate service. Furthermore, rate increases alone cannot be relied upon to counter the effects of severe recession, to offset public policy inequities or to compensate the railroads for losses resulting from acts of nature. Railroad management must look to enhanced productivity, increased sales, intensified use of modern technology, and improved service to realize higher rates of return.

---

[34] *Increased Freight Rates, E., W., and S. Territories, 1956, supra.*

[35] See appendix F. For example, Bessemer and Lake Erie; Chicago and Eastern Illinois; and Duluth, Winnipeg, and Pacific.

Diversification.—Two basic positions have been advanced regarding the effects of railroad diversification on railroad earnings. GMI favors diversification of the railroads to stabilize and to add growth to rail earnings. GMI concentrates on the theoretical benefits from having stable profit-oriented nontransportation sources of income to supplement rail earnings and to provide lower cost sources of capital than generally are available to railroads operating without significant nontransportation income. On the other hand, GSA concentrates on the possible abuses of the diversification/conglomeration trend. GSA is primarily concerned with the misuse of rail assets to benefit nontransportation enterprises without sufficient benefit to the rail carrier. Particularly cited are instances of excessive dividends in the form of undervalued rail assets being floated upward to a holding company, thus weakening the rail carrier's ability to weather earnings setbacks.

The Coordinator is aware of the potential benefits of limited judicious common carrier investment in stable noncarrier business enterprises which would contribute to a soundly financed common carrier system and would not do violence to the established principle that corporations endowed with a public interest should direct their primary activities to their public service operations. See *Greyhound Corp. Stock*, 90 M.C.C. 215, 223 (1962).

The Coordinator recognizes that, while diversification may be beneficial to the Nation's railroads, it is subject to abuse harmful to individual railroads.[36]

It should be noted that the Railroad Revitalization and Regulatory Reform Act of 1976 provides in section 903 for the Commission to prepare and submit a report with appropriate recommendations to the Congress on conglomerates and such other corporate structures as are found in the rail industry within 1 year of the 1976 act's passage. Accordingly, the Commission has instituted

---

[36] See Letter of George M. Stafford, Chairman of the Interstate Commerce Commission, dated September 12, 1975, to Senator Warren G. Magnuson, Chairman, Senate Committee on Commerce; Chairman Harley O. Staggers, Chairman, House Committee on Interstate and Foreign Commerce; and Robert E. Jones, Chairman, House Committee on Public Works and Transportation.

Ex Parte No. 323. In view of this investigation, further discussion is unnecessary.

Dividends.—Throughout the various GMI statements there is an implication that rail dividend payouts are excessive. There is support for the position that rail dividends have been too high. In its 1972 report concerning the problems of the Penn Central the Senate Committee on Commerce stated:

> *** [d]ividends paid by the Pennsylvania Railroad and the New York Central in the 1960-1967 period were extraordinarily high. Starting in 1962 (when the merger agreement required maintenance of the 1.3 ratio for dividend payments) the two railroads actually increased their dividends each year, very carefully maintaining the 1.3 ratio. From 1960 through 1969, dividends totaled $307.5 million ($282 million of which was paid after 1963.) After merger, dividends paid in 1968 were $55.4 million while the Penn Central Railroad lost $2.8 million. The 1969 dividends were $43.4 million while the railroad had a deficit of $82.8 million and a consolidated income of $4.4 million. Considering the severe financial straits, Penn Central's management evidenced a cavalier attitude toward the declaration of dividends. Penn Central management later argued that the dividends kept up the price of stock and gave the railroad a better credit rating. But it is difficult to justify efforts to prop up stock prices in a crisis when no stock issue was ever contemplated. It is also important to note that since dividends were greater than available cash resources, the Penn Central had to borrow money to pay them. This meant higher interest costs in terms of millions of dollars more than the railroad needed to pay. Such high dividends could not be justified. Any favorable consideration the Penn Central might have received as a result of its steady dividend payments could hardly have offset the cash drain of more than $130 million in dividends and related interest payments after the merger.[37]

The Coordinator recognizes, however, that in a nongrowth or limited growth industry, such as the railroad industry, management must often pay substantial dividends to maintain the price level of common stock and to attract additional investment. The Coordinator is appreciative of the railroad arguments that the existing level of dividend payments is necessary to compensate stockholders for lack of appreciation in the market value of their shares. Considering the lack of market appreciation in rail common stock values and the proportion of dividend payouts to shareholders' equity, the Coordinator finds that rail dividend payouts have not been shown on this record to be excessive. Rail dividend yields are, in any event, substantially below those of industrials.[38] The Commission can in its discretion, where warranted, in merger or securities proceedings impose conditions requiring Commission approval of cash dividends where common carrier service might otherwise be harmed. Normally, however, the Commission respects managerial prerogatives in declaring cash dividends so long as the carrier's ability to provide adequate service is not harmed. See, for example, *North Western Employees—Pur.—Chicago & N. W. Ry. Co.*, 342 I.C.C. 58, 88-89 (1972), and *Greyhound Corporation Securities*, 336 I.C.C. 575, 583 (1970).

---

[37] Senate Committee on Commerce, 92d Cong., 2d Sess., *The Penn Central and Other Railroads*, 14-15 (Comm. Print 1972).

[38] See appendix D, pp. 13-24.

Deferred taxes.—The Commission has recently required the carriers to report financial results on a deferred tax basis in lieu of the flow-through or the actual taxes concept.[30] This change is designed to bring Commission accounting practices more into line with generally accepted accounting principles (GAAP). While the order expressly excluded by its own terms a determination that such basis should be used for ratemaking, such question is appropriately considered in this proceeding. This Commission had previously considered and rejected the deferred tax concept for ratemaking in *Accounting for Federal Income Taxes, supra,* at 806.

The Coordinator believes both bases are appropriate for ratemaking consideration. As indicated in the history of general revenue standards, all relevant financial facts should be considered in controlling the general level of railroad freight rates. See generally *Increased Rates and Charges, 1975, supra,* where cost evidence covering both bases was utilized. Consideration of financial data produced under both tax accounting methods is thus appropriate. Under either basis, the railroads' present earnings are at depressed levels and have repeatedly been characterized as substandard and inadequate. To choose between the two accounting methods is, therefore, unnecessary.

There is, nevertheless, some merit to the position expressed by the Commission in *Federal Income Taxes, supra,* 807, that present-day shippers should not prepay taxes of the future through the deferred tax method. On the other hand, the present-day shipper is the beneficiary of capital provided by past investors based on the cash flow provided by past ratepayers, and thus a rigid distinction between past, present, and future ratepayers is necessarily somewhat artificial in considering the long-lived assets necessary to provide adequate railroad service. It is also clear that Congress intended the benefits of liberalized tax methods to stimulate investment, to inure to the benefit of modernized and improved ways of providing service rather than reducing revenue need and, hence, the need for rate increases. In any event, the Coordinator finds that both tax accounting methods are appropriate in weighing the railroads' revenue needs in ratemaking proceedings.

---

[30] See No. 34178 (Sub-No. 2), *Accounting for Income Taxes—Interperiod Tax Allocation (Deferred Taxes)*, decided August 9, 1974, slip opinion, page 11.

Account 532, Railway Tax Accruals.—The SPC believes that this account fails to properly separate taxes related to capital gains from Federal income taxes properly related to rail operations. Such separation is a basic principle of regulatory accounting. Nevertheless, the SPC also concedes that the overstatement of tax expense is not significant on a regional basis although it may be highly significant for individual railroads.

The separation of tax accruals would necessarily require the division of railroad and nonrail activities for accounting purposes into two separate "profit centers" to which fixed costs (depreciation and rent on facilities jointly used for both rail and nonrail purposes, general officers and administrative expenses of a fixed nature, et cetera) would have to be allocated in a rational manner. This would require, in turn, a cost accounting system which would insure the uniform reporting of costs and taxes by each road. Such a system does not presently exist, and in its absence each road (if they have not already done so) would probably improvise its own system for this purpose. As a result, there would be little, if any, uniformity or consistency in the reporting of tax accruals. Even worse, the roads would be in the position to manipulate their cost allocations and taxes to their best advantage.

The Commission has agreed with the SPC in principle in the past; however, the Commission has recognized that the percentage that such nonrail-operating tax amounts bear to total net investment rate base is so small that the effect on rate of return is only very slight. *1956, supra,* 656.

A redefinition of this account can be considered when the entire Uniform System of Accounts for railroads is restructured. The 1976 amendments to the act require that a new accounting system become effective on January 1, 1978, pursuant to new section 20(3)(a). The Coordinator is not inclined to recommend piecemeal amendments to the system of accounts which have such a small effect on rate of return. Thus, the Coordinator supports the principle of such revision but recommends deferral of a revised account 532 to the new proceeding to comprehensively restructure the railroad system of accounts.

Price level accounting.—This method of accounting was urged as a means of more fairly reflecting the impact of inflation upon the railroads. It is argued that the practice of relating present income to an investment base stated in historical dollars fails to consider the dollars' changing purchasing power.

As demonstrated in the discussion of the history of return on investment, *infra,* the Commission has traditionally considered the impact of inflation in determining revenue need. However, price level accounting has not been shown to be the best method of determining a fair rate of return. The parties failed to proffer any methods or indices to be used in effecting price level adjustments, nor have any been acknowledged as perfected or generally accepted. The effects of inflation have been recognized in this report and, as more fully described in the funds flow section, the swing in the purchasing power of the dollar has and will continue to be considered and made a factor in assessing revenue need. It is, therefore, concluded that no need for conversion to an unspecified method of price level accounting has been shown to be warranted.

DISCUSSION AND CONCLUSIONS

FUNDS FLOW ANALYSIS

In the interim report served on February 7, 1974 (345 I.C.C. 55), the Coordinator indicated that the issue of funds flow analysis and its possible implementation required further consideration. The issue was not resolved at the time because of the complexity of the matter. The critical question at that juncture in the proceeding was not one concerning the conceptual validity of funds flow analysis but rather one concerning the practicality of implementing the analytical methodology and resolving all the mechanical problems associated with such an undertaking. Thus, the proposal as well as the views of other interested parties of record has required further study and evaluation with the objective of developing the concept into a workable tool.

The probative value of funds flow data for reporting and ratemaking purposes has been a matter of issue in several recent Commission proceedings. In Docket No. 35344, *Annual Reports of Class I Railroad Companies,* 341 I.C.C. 205, 213 (1972), the Commission passed upon the merits of such data requirements for railroad reporting purposes by observing that the proposed schedule, Schedule 397, Statement of Changes in Financial Position,[41] is designed:

---

[41] The statement format in which flow of funds data is reported by the accounting profession is generally entitled "Statement of Changes of Financial Postion." Other commonly used titles are "Sources and Application of Funds Statement," "Source and Use of Funds Statement," and "Funds Flow Statement."

> *** to provide an accurate statement of the flow of funds by requiring disclosure of their source and application. The purpose of this new Schedule is, among other things, to inform the Commission more accurately than in the past of the cash flow of the regulated carriers. This is a most important matter in view of the numerous carrier requests for authority to undertake financial transactions which the Commission must evaluate. We are also required to inform the Congress of the condition of the regulated industry, and source and application of funds is a most important aspect of that condition.***

Similarly, the disclosure requirements for motor carriers were expanded to include the mandatory filing of funds flow data in Docket No. 35129 (Sub-No. 3), *Annual Reports of Motor Carriers of Property*, 346 I.C.C. 528 (1974). The next step was the requiring of funds flow data for use in ratemaking. For the purposes of evaluating motor carrier revenue need in general increase proceedings, the mandatory filing of historical funds flow data was established as a minimum evidentiary requirement in Ex Parte No. MC-82, *New Procedures in Motor Carrier Rev. Pro.*, 351 I.C.C. 1, 44-45 (1975).[42] In Ex Parte No. 290, *Procedures Governing Rail General Increase Proc.*, 351 I.C.C. 544, 558-559 (1976),[42] similar evidential requirements were established for the railroads. In this latter proceeding, the DOT advocated the use of projected funds flow analysis as the principal determinant of the railroads' revenue and other financial needs. However, in that proceeding the Commission rejected DOT's proposal on the grounds that the compilation of projected funds flow data would impose an unnecessary burden on the railroads. In this proceeding, however, the Coordinator recognizes the need for development of such data, not as an evidentiary burden on the carriers, but as an instrument of regulation for the Commission's use in discharging its various responsibilities under the act. However, it must be emphasized that these projections are not infallible statements of what will occur, but rather economic and accounting techniques which result in reliable probabilities.

This is not to imply, however, that funds flow analysis is to be used to the exclusion of the many and varied other considerations and measurement standards which bear either directly or indirectly upon the question of railroad revenue need. On the contrary, funds flow analysis is perceived to be but one decisional tool which can be used by the Commission. As pointed out earlier, in the survey of the rule of ratemaking, the Commission has never in the past relied solely upon any particular criterion to guage the adequacy of railroad revenues. Given the complexities of the business environment in which the railroads currently operate, there appears to be no reason why the Commission should depart from this policy at the present time or in the future. Thus, the funds flow methodology formulated in this report serves to provide a more comprehensive framework of data and information which will facilitate the employment of various tests and measures of railroad revenue need to the exclusion of none.

---

[42] Pending on reconsideration.

It is the Coordinator's belief that the determination of railroad revenue need and of the adequacy of rate levels must be largely forward-looking in scope and continuous. In the past, the Commission's determination of railroad revenue need has largely been based on historical financial data not precisely reflective of the carriers' revenue need on the effective dates of the increases sought. With the adoption of the funds flow methodology advocated here, however, the Commission will have at its constant disposal a computerized data base to facilitate the measuring of revenue need on a continuing, timely basis.

The Coordinator is optimistic that the use of this data base and projected funds flow analysis will provide a better measure of the general rate increases the railroads will need to sustain operations. It will also put into clearer focus what the railroads and perhaps the Government must accomplish towards these ends. The basic media through which these purposes are achieved are the flow of funds projections, the underlying balance sheet and income and expense forecasts, and the financial ratios generated by the model.[43] These data are contained in appendix K of the report, together with historical balance sheet, income statement and funds flow data, which when cojoined with the projected data, permit the Commission to readily assess trends adversely affecting the public interest.

It should be emphasized here that the various projections generated by the model are not intended to predict in the strictest sense "what will be." Rather, what the model seeks to project is something closer to a "what should be" world, based on the Commission's best estimate of (1) the spending levels the railroads should achieve in the future to arrest the deterioration of rail plant and maintain the same level of service; and (2) the funds they should obtain through income generation, additional borrowings, and other means, to support such spending levels. A "what will be" scenario is undersirable for these purposes because it would project spending levels constrained within the limits of the railroads' future earning power, and as a consequence, would most likely understate the capital needs of the industry to arrest the deterioration in rail plant.[44] The desire here, in contrast, is to impose no income constraints on the railroads' expenditure levels in order that their capital needs can be clearly manifested. This is accomplished by projecting the future course of rail operations along essentially two separate lines. Along one line, the railroads' net investment in operating property and associated borrowings are projected to determine the dimensions of the resource base required to meet the demand for future rail service. Along the other line, the income the railroads will most likely earn from the commitment of these resources is projected to approximate their future earning power, a principal source of funds. Earning power, borrowing capacity, and spending levels are brought together in the flow of funds projections to portray the adequacy of future capital inflows relative to the railroads long range capital needs. For ease of comprehension, the process is depicted in diagram I.

---

[43] Reference is made to the projected funds flow methodology in various ways throughout the report: "projected funds flow analysis," "projected funds flow model," "PFFA," or more simply, "model."

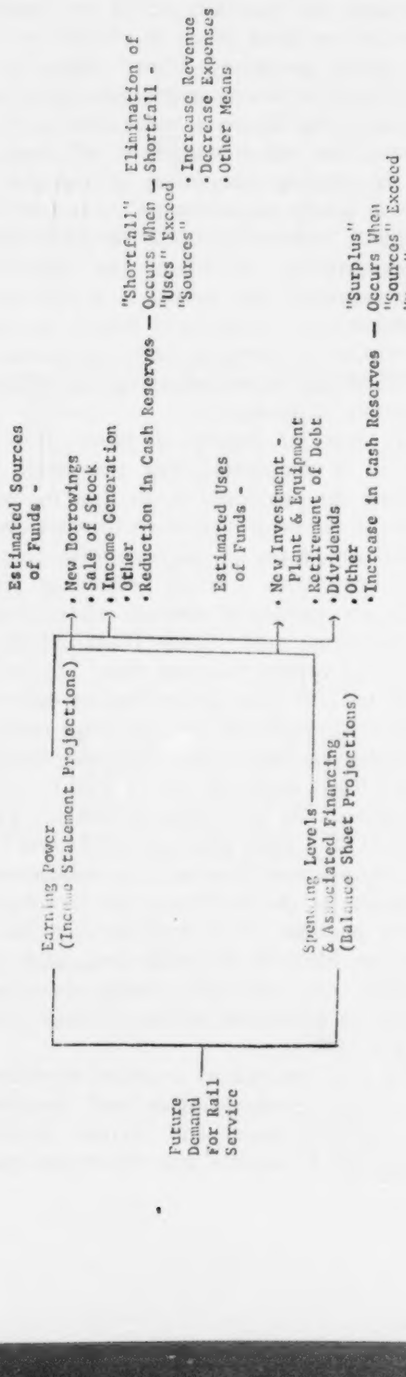
These estimated future spendings and inflows of funds are related for analytical purposes by the projected funds flow statement. Where projected spendings (uses of funds) exceed the railroads' estimated capacity to fund such spendings through income generation and additional borrowings (sources of funds), the model shows a "shortfall" of funds. The "shortfall," in turn, is a hypothetical figure representing additional funds the roads would have to acquire to support such spendings. This shortfall could be eliminated in a number of ways; additional funds could be obtained through increased traffic volume, increased operating efficiency, the infusion of new capital, et cetera. Estimates of the revenue increases or decreases in operating expenses which would be required to eliminate the shortfalls, projected over a 10-year period, are presented in appendix K (see Shortfall Elimination Statement).

Where shortfalls are projected, the model is not contemplating that such conditions will in fact prevail. It is recognized that, as a

---

[44] For purposes of clarification, a "what will be" forecast would predict the railroads' reactive behavior in all respects to their expected business environment. Within this scenario, therefore, projected spending would be held in check by projected income flows. As a result, the railroads future capital needs would likely be understated. The outcome would be a projected funds flow statement showing "uses" equal to "sources," or the inference of no need for additional capital. Witness William R. Martin for the railroads points out this fundamental flaw in his verified statement in reply to the SPC's opening statement.

Diagram I
Process For Determining Long Range Capital Needs
Projected Funds Flow Analysis


Future Demand For Rail Service
Earning Power (Income Statement Projections)
Spending Levels & Associated Financing (Balance Sheet Projections)
Estimated Sources of Funds -
• New Borrowings
• Sale of Stock
• Income Generation
• Other
• Reduction in Cash Reserves
"Shortfall" Occurs When "Uses" Exceed "Sources"
Elimination of Shortfall -
• Increase Revenue
• Decrease Expenses
• Other Means
Estimated Uses of Funds -
• New Investment - Plant & Equipment
• Retirement of Debt
• Dividends
• Other
• Increase in Cash Reserves
"Surplus" Occurs When "Sources" Exceed "Uses"

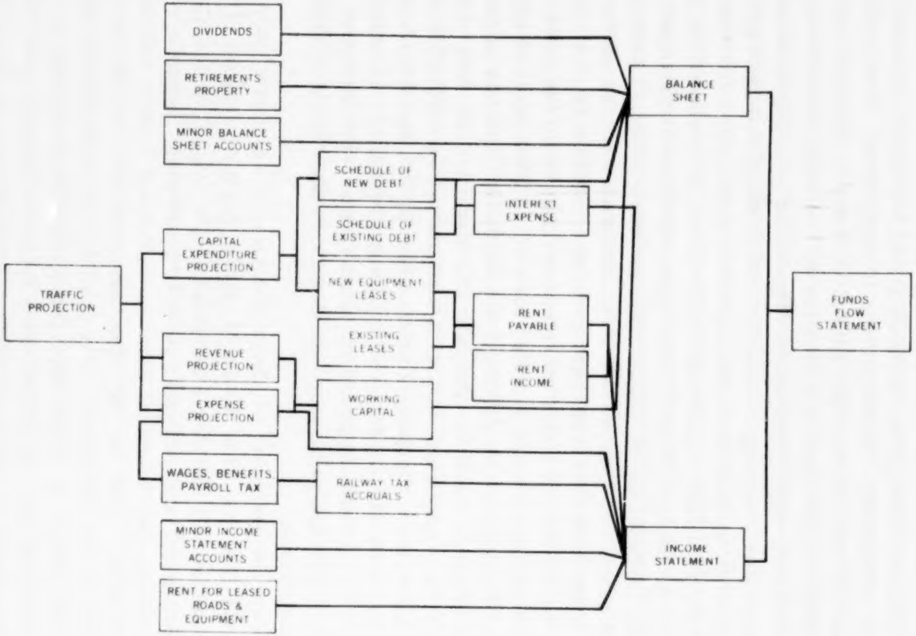
practical matter, shortfalls of the magnitude projected would not occur because the railroads would not budget spendings beyond their capacity to fund them. It should be emphasized that the spending levels projected ("use" items in the flow of funds projections) are not necessarily reflective of what the railroads will in fact spend in the future to meet their operating requirements. It is recognized that rail management will largely decide this matter, based on its ongoing assessment of business circumstances. Thus, the spending levels projected by the model may be more or less than adequate, depending upon the railroads' future operational needs. Recognizing, therefore, the dynamic nature of future business conditions, the model is programmed to generate in a timely fashion new projections based on the most current data available relative to changing traffic mixes and levels, inflation rates and other pertinent factors affecting the railroads' income prospects and propensity to spend.

Basic features of projected funds flow model.—Diagram II illustrates in a simplified way the basic process involved in implementing the projected funds flow methodology. The primary end product is the projected funds flow statement, which brings out the shortfall or excess of funds relative to the railroads' ongoing needs for capital to provide adequate transportation service. Byproducts are projected balance sheet, income statements and selected financial ratio data from which various alternative formulations of carrier revenue need can be obtained. These data were projected for four groupings of railroads: (1) the eastern district carriers, excluding the bankrupt carriers and Conrail, also referred to in this report as "East less bankrupts" (meaning carriers in bankruptcy in 1974); (2) the southern district carriers; (3) the western district roads, excluding Rock Island; and (4) the total population of class I roads, excluding the bankrupt carriers and Conrail. No reasonably reliable projections could be made for the bankrupts and ConRail carriers at this time due to their peculiar needs and the fact that they are undergoing reorganization. Methods for projecting funds flow for the bankrupts and ConRail are currently being developed. The model is programmed to generated projected data over a 10-year forecast period (1976-1985).

Appendix J of the report contains detailed explanations of the various forecast methodologies and premises upon which the underlying balance sheet and income statement projections are based. Diagram I depicts the interrelations among the various

DIAGRAM II

FUNDS FLOW METHODOLOGY


DIVIDENDS
RETIREMENTS PROPERTY
MINOR BALANCE SHEET ACCOUNTS
TRAFFIC PROJECTION
CAPITAL EXPENDITURE PROJECTION
REVENUE PROJECTION
EXPENSE PROJECTION
WAGES, BENEFITS PAYROLL TAX
MINOR INCOME STATEMENT ACCOUNTS
RENT FOR LEASED ROADS & EQUIPMENT
SCHEDULE OF NEW DEBT
SCHEDULE OF EXISTING DEBT
NEW EQUIPMENT LEASES
EXISTING LEASES
WORKING CAPITAL
RAILWAY TAX ACCRUALS
INTEREST EXPENSE
RENT PAYABLE
RENT INCOME
BALANCE SHEET
INCOME STATEMENT
FUNDS FLOW STATEMENT

methodologies. For ease of comprehension, a brief explanation of these methodologies and their interrelationships are presented below.

As shown in the diagram, the beginning point is a set of traffic projections (ton-miles for each group, tonnage originated by two-digit commodity classes for the United States). These projections lead in turn to the projection of freight revenues and freight expenses (total operating revenue and expense levels being derived therefrom) and equipment expenditures. Assumptions as to equipment financing control the estimates of principal and interest payments, as well as rental payments. Particular care was taken to develop reliable, constant 1975-dollar projections in order to achieve greatest flexibility in applying different assumptions as to rates of inflation. A relationship between inflation rates in wages and prices and general rate level increases was estimated, based on the experience of recent years. Future inflation rates are projected by estimating the historical relationship between the price index for each component and a price index at a higher level of aggregation for which long-term forecasts are available from one of the leading econometric models. Freight expenses are broken down into different categories—wages, health and welfare benefits, pensions, fuel, loss and damage, materials and supplies, and depreciation and retirements—in order to facilitate repricing of expenses in accordance with assumed inflation rates. Track expenses are also separated (and in turn broken down into materials and labor for the same reason).

For the purpose of these analyses, a computer tape of data compiled by the Federal Rail Administration from the Commission's *Transport Statistics in the United States*, Part I, was reproduced and refined, providing revenue, expense, operating statistics, and financial data on individual class I railroads. This source was used for the observation period 1962-70; for 1971-75, much more information was available on Commission tapes. The combination of these data required special editing to maintain stability in the list of railroads included (class I) over the whole observation period. In large part, relationships or trends estimated from historical series (for which 1962-75 data were available) were obtained by statistical regression analysis.[45] Where only 1971-75 data were accessible by computer, regression analysis was not used, since that technique requires a larger data base for reliability.

---

[45] See appendix M, Glossary of Technical Terms, for a definition of regression analysis.

Instead, averages of data for appropriate years between 1971 and 1974 were taken. Special banks were created containing only data from the R-1 Annual Reports that would be used directly for the projections; the data were entered as group aggregates.

For purposes of projecting equipment and roadway facility retirements and depreciation, computerized programs were used—an estimated survival curve program using available age distribution data in physical units for freight cars and a simulated plant-record program applied to historical dollar values of additions and retirements for roadway facilities.[46]

Development of projected funds flow computer system.—The majority of the computer processing was done on a DEC System-10 augmented by the Commission's Univac Series 70 computers. All resulting data files are stored on disc on the DEC-10 using "1022," data base management language. FORTRAN DPL (1022's report language) and STATPACK (a statistical package developed by Western Michigan University) were the primary languages utilized in the processing and analysis of the data.

The major source of the information used in constructing the funds flow data base was the Annual Report Form R-1, Class I Railroads (-1). This is a form filed with the Commission annually by all class I railroads. It is subject to annual revisions and, for simplification, all references to schedule numbers, line numbers, or column indicators are keyed to the 1974 report form.

The data elements utilized from the R-1's were captured from four sources:

- the actual R-1's;
- *Transport Statistics in the United States,* Part I;[47]
- data files created annually by the Commission; and
- a data file compiled by the Federal Rail Administration.

As stated above, the data file compiled by the Federal Rail Administration for the years 1962 to 1971 was collected utilizing the ICC's *Transport Statistics in the United States,* Part I, for the respective years. It consists of approximately 800 data elements for each class I railroad for each year. There are 113 railroads included on the file but, because of mergers, terminations of operations, and other reasons, there are no data for each road for each year.

---

[46] See Forecast Methodology No. 8 for a detailed explanation of the technique employed to project retirements. Also see the discussion of the underlying studies at pages 1522-1537 of this report.

[47] *Transport Statistics in the United States* are compiled from the data submitted in the R-1's.

Appendix N indicates which schedules from the R-1 are represented in this data file. Not all lines or columns are included for all schedules. Complete documentation for this data file has been published and should be available from the Federal Rail Administration. It should be noted that some errors do exist in this data file, most probably introduced during the data capturing process, and some editing of the data should be performed before the data is utilized.

The data files compiled annually by the Commission are a much more comprehensive and complete representation of the R-1, information. The Commission's computer files begin with 1971 data; additional years become available as data capturing and corrective editing are completed. The Commission's files contain as much as 5,000 data elements for each railroad. Appendix N also indicates which schedules from the R-1 are included. Not all lines and columns are available for each schedule, but the major schedules are fully duplicated. Complete documentation and copies of the data files are available from the Commission. Additional data elements were either extracted from individual R-1's or from other publications.

The following additional data files were integrated into the data base:

. Annual Wage Statistics Report (1966-1974),

. Annual Commodity Statistics (Quarterly Commodity Statistics are presently being data captured and will be utilized in the future), and

. various statistics compiled by the American Association of Railroads (AAR) and available either in an automated or published form.

This R-1 data base, augmented by the various other data files and econometric factors, forms the funds flow data base. The computer processes applied to this data base were quite varied. The data were summarized by the following three groups:

. East less bankrupt carriers and ConRail,
. South,
. West less Rock Island.

(Appendix I lists the railroads included in each of the above groupings.)

The methodologies described in appendix J were applied to these data, manually or by automated means to generate the forecast data.

The resulting file of historical and projected data is the sole source of all published exhibits.

Selection of flow of funds format.—There exists an almost infinite number of funds flow formats from which the preparer of such a statement may choose to show changes in financial accounts representing flows of funds in and out of a company or group of companies. The format chosen was designed to highlight balance sheet accounts critical to a revenue need determination, while aggregating certain accounts of lesser significance and materiality. For example, the funds flow statement in the railroads' R-1 Annual Reports to the Commission (Schedule 309, Statement of Changes in Financial Position) elaborates three separate reserve accounts under the category of noncash sources of funds, while the data file adds these accounts together. In analyzing the railroads' general financial condition and historical funds flows leading to that condition, the changes in individual reserve accounts can be readily ascertained from examining the railroads' R-1's. But the use of funds flow as a tool of revenue need analysis does not appear to require such detail.

The format furthermore shows net funds flow in or out of individual accounts. Gross funds flows, the alternative, would appear as a simultaneous increase or decrease in an account, both as a source and use of funds. For example, with respect to long-term debt, a gross flow would show new debt as an increase, or source of funds, and repayment of existing debt, at the same time, as a decrease, or use of funds. A net flow would show simply an increase or decrease in debt, depending upon whether new borrowings exceeded repayments. For the sake of simplicity and the intended use of the funds flow mechanism as a tool of revenue need determination, however, only net flows are recorded. In most cases, where more information pertaining to a particular gross flow is desired, such information can be readily obtained from the forecast methodology related to that flow of funds item, whether it be a source or use of funds.

The funds flow format here devised is meant to be a flexible and sensitive tool for measuring the magnitude of the railroads' revenue needs under any number of different assumptions. This tool can be used to answer the question of how much additional revenue the railroads will need in a given year to equate the projected need for funds with the projected sources of funds which will become available, given a set of realistic assumptions. This is the same as asking: if the needed level of working capital and fixed plant in the industry is financed by amounts of debt and equity capital the railroads can predictably secure, how much of a shortfall of funds, if any, will occur? The approach taken here, in contrast to the exclusive employment of a fair rate of return standard, bases the revenue need analysis on the minimum level of resources needed to maintain efficient railroad operations, including a fair rate of return.

Alternative indicia of revenue need can easily be made using the various data produced by the funds flow model. One indication of revenue need, for example, is the carriers' debt-equity ratio. Having projected all uses of funds and those sources of funds other than internally generated funds (retained earnings), the funds flow format could be used to show the marginal level of net income (or revenue) needed to achieve or maintain a specific mix of debt and equity capital in the carriers' capital structure.

Profitability, or the realization of a specific rate of return, is another indication of revenue need. The income projections in appendix K serve as the bases for approximating the additional revenue that would have to be generated to earn a specific, target rate of return.

Another example of the flexibility of this funds flow model relates to deferred maintenance. The model may be used to focus on the difference between projected net income and the net income that would be obtained if all deferred maintenance will be eliminated over a certain period of time. This difference can be translated into a revenue need. The funds flow format, then, was slected to highlight those balance sheet and income statement items cental to revenue need analysis.

Use of group data.—The funds flow model and all other financial data appended to this report segregate the total population of class I railroads on a district basis, excluding all bankrupt carriers and ConRail. While these divisions are slightly different from those chosen for ratemaking purposes (i.e., the three geographical districts including the bankrupt roads), the concept of group analysis, as opposed to the analysis of individual roads, is the one ordinarily applied in general increase proceedings.

For these purposes, the benefits of using group data are thought to outweigh the disadvantages. Critics of the use of group data contend that the determination of new rate levels for composites of railroads allows competitively weaker roads to continue survival at a minimum necessary level of income while financially stronger and operationally more efficient roads reap windfall profits at the same rate levels. On the other hand, the use of group data recognizes that the many individual railroads which make up the industry comprise a "system." That is, much of the Nation's rail freight is moved from origin to destination over the lines of more than one road and charges for such movements by the individual roads involved must, therefore, be consistent. Grouping these carriers on a district basis is also desirable because it takes cognizance of the regional characteristics of the lines studied.

Because funds flow analysis is meant to serve as one means by which the Commission can evaluate railroad revenue need, the group data approach is also most appropriate for assemblage of financial data for that analysis. The bankrupt roads and ConRail, as previously mentioned, have been excluded from the study groups due to their peculiar circumstances. It would be premature at this time to develop and publish funds flow projections for these carriers, particularly ConRail which is currently at a very formative point in its development as a newly integrated rail system. However, the need for developing separate projections for these carriers in the future is recognized. Accordingly, a number of different ways of achieving this objective based on data and information now available to the Commission are being explored to permit projections for these carriers.[48]

Development of Historical Data.—Railroad revenue need cannot be analyzed in a vacuum and, although the future needs of the railroads must serve as the focus of the projected funds flow study effort, some recognition must be given to the past in order to provide an appropriate view of the railroads' financial development. For this reason, historical data - balance sheets, income statements, funds flow statements and schedules of financial ratios - are included in appendix K.

Historical data are provided also as the foundation for certain projections and the basis for revenue need factors which are central to the implementation of the funds flow model. Various financial statement items thought to be less affected by future economic developments than by their own past momentum were projected on the basis of their historical trends. Relationships between many historical accounts, such as the relationship of Federal income taxes to taxable railroad income, were also relevant to the forecasting of these accounts. Since historical data play a major role in the forecasting process, such data were included in the report.

---

[48] Although no separate projections for the bankrupt carriers and ConRail are included in this report, a limited amount of data for these carriers were compiled to develop the bases for projecting operating equipment expenditures, rent income, and rents payable. These data are included in appendix J, Forecast Methodology Nos. 4A and 9.

Finally, historical data have also been included to serve as a data base for financial ratio analysis. Selected financial ratios can be used in conjunction with the funds flow model to alternatively measure railroad revenue need. For example, one consideration is the prevention of any further deterioration in the railroads' borrowing capacity as indicated by their level of fixed charge coverage. Historical financial ratios can be compared to projected ratios as the bases for this type of revenue need measure. In short, the historical data appended to the report is an integral part of the data base constructed to determine the industry's future revenue needs.

The need for forecast data (rationale for 10-year time frame).—The funds flow and other financial statement projections span a 10-year period from 1976-85. The issue of an appropriate choice of time frames for projections received little attention in the present record. William R. Martin of the Association of American Railroads, in his Reply to the SPC's Opening Statement, uses his Financial Reports Output Generator (FROG) to create 10-year financial projections. His rationale for a 10-year forecast period is "*** to give a clear understanding of the trends involved."

This reasoning is also that of the Coordinator who believes that it is necessary to show projections over a 10-year period in order to best depict the impact on the railroads' financial performance during the 1980's of decisions and policies carried out in the 70's. For example, it has been assumed for forecast purposes that due to the stringency of the capital markets in the 1970's, the railroads will be able to refinance only a portion of maturing bond issues while relying more heavily on equipment debt financing over the 1976-85 forecast period. Naturally, the full impact of such an assumption will not be apparent in the 1976 projections, but 1985 projections should show the cumulative effects of such financing. By 1985, the decline in the railroads' working capital or the rise in their debt-equity ratio which could conceivably follow from the reliance on a growing level of equipment obligations requiring substantial downpayments should be evident.

It has been observed that 10-year forecasts are the frequent choice of other organizations interested in the railroads' future. The United States Railway Association, in projecting the success of their proposed Consolidated Rail Corporation, has used a 10-year time frame beginning in 1976 and ending in 1985.[49] Accordingly, First

---

[49] United States Railway Association, *Final System Plan*, Volume 1, pp. 51-55, 71-73.

National City Bank has used the same 10-year period in an analysis of USRA's *Final System Plan.*[50]

It is important to understand that there is no presumption as to the infallibility of the projections. Just as forecasting assumptions start impacting on the first year results but can only be clearly understood after 10 years or more, assumptions which have not come to fruition will have the most substantial impact, causing the greatest inaccuracies, by the tenth forecast year. The first year forecasts will nevertheless be the most accurate, as it is imperative that they should be, since requests from the industry for rate relief will be predicated on revenue needs occurring in the future period immediately following the date of the request. As new trends develop and new data become available, the impacts of these factors will be included in the projections.

It is recognized that the income projections are susceptible to the greatest amount of error due to the myriad of unforeseen events which can materially impact on and alter the trends in railroad revenues and operating expenses. As these events are difficult, if not impossible, to predict for the latter years of the forecast period, none of the long-range forecast methodologies have been specially engineered to account for their possible impacts. To assure the accuracy of the first year income projections, however, a special short-term forecast methodology is being formulated (see appendix J, Forecast Methodology No. 20). This methodology provides the basic design for a quarterly forecast model to predict more accurately railroad revenue and operating expenses and their changes resulting from changes in traffic levels, the mix of traffic, and other factors affecting these key items in the short run. It is anticipated that the revenue and expense estimates generated by this special model will be entered into the 10-year long-range model to provide more accurate revenue and operating expense figures. To maintain the continued operation of this quarterly forecast model, there is the need to expand the funds flow data base to include quarterly CBS (Condensed Balance Sheet) and RE&I (Revenues, Expenses, and Income) data filed with the Commission by the carriers. This additional effort will require the expeditious quarterly processing of these data.

The need for financial ratio data.—Financial ratios based on historical and projected data (see appendix J, Forecast Methodology

---

[50] John W. Ingraham, Vice President, First National City Bank, *A Capital Markets Analysis of the Final System Plan as Proposed by the United States Railway Association*, appendix A, pp. 109-117.

No. 19) have been presented as a means of (1) summarizing the railroads' financial performance, (2) facilitating trend analyses, and (3) assisting in revenue need analysis. A financial ratio is a convenient and widely accepted analytical tool which relates two or more financial statement accounts in ratio form to describe one aspect of a company or group of companies' financial condition or profitability. The financial ratio schedules included in this report can, therefore, be used to assess particular aspects of the railroads' performance in any given historical year, to assess potential performance in any given projected year, and to make comparisons between railroad groups.

The ratio schedules can be used to discern meaningful trends over time. For example, changes in the railroads' mixes of debt and equity capital, changes in their working capital levels relative to their operating expenses, changes in their coverage of fixed charges, and changes in their rate of profitability are all made apparent by the study of trends in financial ratios. Associated with the usefulness of ratio trends as tools for the detection of changing patterns of financial performance, is their ability to indicate the need for regulatory or other public policy changes.

When considered together with funds flow projections, financial ratios can be indicators of revenue need. That is, revenue requirements can be keyed to the maintenance or achievement of a certain financial ratio. For example, if the railroads' debt-equity ratio rises above a certain point and their fixed charge coverage ratio falls below a certain standard, they will experience difficulty finding outside capital and/or pay a higher rate of interest for capital. Standards to be maintained for these ratios can act to define revenue need by specifying a certain level of revenue to insure that marginal fund flows will be of the proportions necessary to meet the target ratios. Financial ratios are needed, then, to summarize and analyze the railroads' financial performance at one point in time or over period of time, as well as to provide alternative and various definitions of revenue need. Their use for the purpose of determining railroad revenue need is in keeping with the Coordinator's belief that no one criterion or measure can be solely relied upon to the exclusion of other standards.

Cost of capital and related studies.—The purpose of projected funds flow analysis is to provide a means of ascertaining railroad revenue need. Funds flow analysis is a very comprehensive tool which can be used to consider rate of return and railroad cost of capital as well as other dimensions of revenue need. Assumptions as to the cost of capital required to be earned by the railroads to attract outside debt and equity capital can be "filtered" through the projected funds flow model to arrive at those revenues the railroad would need to achieve targeted rates of return.

As discussed in more detail in the rate of return section of this report, there have been a large number of railroad cost of capital studies entered into the Ex Parte No. 271 record. Witnesses Foster, Nelson (GMI), the GSA, and the DOT have all suggested that the railroad's appropriate rate of return on net investment, based on cost of capital requirements, is between 8 and 10 percent. Studies by four major railroads of their own costs of capital suggest that they should be earning between a 10- and 12-percent annual rate of return. These target returns are somewhat higher than the 6-percent return on net investment which the Commission in the Ex Parte No. 265 general increase proceeding established as being needed to provide improved services in the future. The Commission also established with respect to the Ex Parte No. 265 increases that the carriers should make every effort to earn a return of 8 percent on shareholders' equity. A cost of capital study appended as appendix L develops a 9-percent return figure for the railroads' cost of equity capital. Taken together, these studies and rate of return targets suggest that the railroads should earn a return of between 6 and 10 percent on their net investment base.

Summary explanation of forecast procedures and premises.—The projection of railroad funds flow requires the establishment of forecast premises and methodologies for projecting key balance sheet and income statement items over the forecast period. The procedures employed for this purpose are summarized below, and are explained in more detail in appendix J of this report.

Traffic projections.—Regression analysis was used to find the relationship of ton-miles by railroad group and of U.S. total tons originated to real Gross National Product and to specific commodity production. Forecasts of GNP and production were derived by adjusting long-term forecasts of Data Resources, Inc., to follow more closely the historical pattern of business cycles. This adjustment resulted in projected recessions for 1979 and 1984. The forecasts of GNP and specific commodity production were then applied to the regression equation to obtain projections of ton-miles by group and of tons originated nationwide.

Operating revenues.—Factors were obtained from a special statistical study of the 1969 rate structure (from the carload waybill sample) to adjust constant dollar revenue per ton-mile for the continuing change in traffic mix (based on two-digit commodity groups), the length of haul, and the tonnage per car by commodity. The same adjustment was made to all groups' revenue per ton-mile for 1975. These revenue per ton-mile projections were combined with the ton-mile projections to obtain the freight revenue projections. A study of recent experience in Commission approval of general increases, led to the development of a relationship between current and 1-year lagged increases in wages and prices vs. rate level increases; the AAR wage and price index, used for this purpose, evidently weights wages very heavily. This corresponds well with Commission practice in granting general increases intended to cover operating cost increases. The heretofore quarterly forecasts can be used to assess the impacts of inflation and to refine the accuracy of first-year revenue projections.

Operating expenses.—Development of the freight service portions of all expense categories required some estimation even to obtain a historical series from which to project. Compensation (from the Commission's Wage Statistics) less track laying and surfacing, was related to gross ton-miles or train-miles by regression; the analysis recognized the possibility of dwindling productivity gains over the coming decade. Materials and supplies (a residual category after deducting the other categories from operating expenses) and fuel (only locomotive fuel) were related by regression to revenue ton-miles. For loss and damage, appropriate price indices were included in the regression analysis. This permitted direct derivation of inflated dollar results from the equations. Additionally, health and welfare benefits and pensions for each group were related historically to compensation by using regression analysis for projection purposes.

Separate projections of track labor and materials were made. Rail and tie projections were based on engineering service lives (gross ton life for rails; years of service for ties) and a special formulation of equated track miles. Ballast was related by regression to tie expense and other track material to rail expense. Track laying and surfacing was related to combined track materials. Addition and betterment expenditures for all nondepreciable road property were derived by applying average ratios of such expenditures to track operating expenses for recent years.

Depreciation charges were obtained with the computerized programs mentioned in an earlier section. Retirements (a group of operating expense accounts) were estimated as 1962-75 averages since most groups' amounts were erratic through the entire period.

The foregoing expenses were projected first in constant 1975 dollars. For conversion to inflated dollars, several price indices were projected: i.e., the AAR wage index (using the calculated effects of terms of the present labor contract for the first 2 years), fuel, wholesale price index, consumer price index, and the AAR index for materials (used for track series).

Rents.—Car hire payments consist of rents for long-term leases and short-term railroad-owned per diem/mileage or private car-line mileage payments, et cetera. Long-term lease payments were estimated by scheduling out existing lease balances (Forecast Methodology No. 7) and adding an appropriate portion of projected new freight car expenditures representing what would be financed through long-term leases (Forecast Methodology No. 14). Of the short-term rental payments, only the projected per diem/mileage payments on railroad-owned cars and the rental for railbox cars were directly linked to the car expenditure projections. These rentals were tied to the projected owner-ship (and portion of owned cars used by other lines) for each group or, in the case of the railbox rentals, to the projected total car requirements provided by private car-lines (Forecast Methodology No. 9).

Locomotive, work equipment, and joint-facility rents payable and receivable were projected separately. Either constant averages, time trends or relationships to ton-miles and a price index (obtained by regression analysis)—as appropriate—were relied upon to make these projections (Forecast Methodology No. 9).

A major task in all these projections was the correction for price inflation necessary to conduct initial analyses of time trends or relationship to traffic and then to reprice to inflated dollars. A special equipment rent index was constructed to recognize the lag in reflecting equipment price increases, but many of the rental costs are embedded and this aspect may not have been adequately captured. The increase in rentals was related to some proportion of current increases in wage and material prices for the projections of joint-facility rents.

Taxes.—State income and property taxes, and Federal income taxes, both current and deferred, were projected on the basis of historical average tax rates (Forecast Methodology No. 15). The average percentage relationship between these individual tax components and taxable railway income were applied to projections of taxable income in order to estimate railway tax accruals and for deferred taxes. Another tax component, payroll taxes, was projected to rise from about 15 to 16 percent of compensation during the forecast period. This level of payroll taxes is judged to be about the maximum that is likely to be levied.

Fixed charges.—Fixed charges consist of rents for leased roads and equipment and also interest on funded and unfunded debt. Due to their long-term nature and relative constancy over the last several years, rents for leased roads and equipment were projected at their 1975 levels in each forecast year (Forecast Methodology No. 13).

Interest on funded debt is the total of projected interest on long-term debts unmatured at yearend 1975 (Forecast Methodology No. 6), plus interest on new debt which will be incurred to finance projected capital expenditure (Forecast Methodology No. 10). Interest rates, on which projected interest expenses are based, are derived by regressing historical yields on railroad debt on such economic factors as money, Federal fiscal policy, and past rates of inflation (Forecast Methodology No. 12). Interest on unfunded debt was projected using historical percentage relationships between that interest expense and total current liabilities. When necessary, these projections of interest will be refined and modified to reflect established changes in the various economic factors considered.

Equipment expenditures (Forecast Methodology No. 4A).—The Bureau of Labor Statistics (BLS) wholesale price index for railroad equipment served as a satisfactory deflator and as the basis for projecting future inflation rates for equipment; the BLS motor vehicle and equipment price index served well for the highway and miscellaneous equipment category.

The effort was largely concentrated on freight cars but also covered as separate categories: additions and betterments to equipment, locomotives, highway and miscellaneous work equipment. The freight car projections were developed on a national basis, broken down by car type. The study projected trends in utilization (trips per year); to related carloadings for each type to key commodities (by regression analysis); and thus projected fleet requirements for each type. This was converted to the portion owned by the railroads and combined with projected retirements (by computerized survival curve analysis) to yield units projected to be installed each year. The prices applied to these units were derived by charting and fitting regression lines to trends in deflated average cost of cars installed (for rebuilt and new units separately) and in the proportion of cars rebuilt, by type. Finally, two approaches for allocating the car expenditures to each group were synthesized—one based on the historic share of cars installed and the other based on projected traffic and retirements for each group.

For locomotives, the projections are based on utilization trends for road and switching units separately. Projections of locomotive unit-miles (for road) and carloads (for switching) were made consistent with the initial traffic projections. Retirements were also obtained by a computerized survival curve program, and estimated units installed were priced out in a manner similar to that for freight cars. The industry total expenditures were allocated to each group on the basis of trends in historical installation shares.

For the remaining equipment categories the projections represent essentially the average constant dollar level of expenditures of recent years.

Roadway facility expenditures (Forecast Methodology No. 4B).—Roadway facilities include stations, car shops, communications systems, and other fixed property that is depreciable. Various sources were consulted to examine levels of new expenditures, patterns of substitution of new technology for old, et cetera, and normalized constant expenditure levels were obtained for each group. The examination of past trends in investment expenditures required conversion of historical data to constant dollars, which in turn involved updating ICC indices formerly used for valuations on a reproduction cost basis. Suitable aggregate price indices (relating to fixed private investment) were found to which the roadway indices could be related for purposes of projecting future inflation rates.

Depreciation.—The depreciation projections of depreciation base, reserve, and expense, for equipment and road property for the period 1976-1985, were developed through the use of an actuarial analysis, Simulated Plant Record analysis, and a renewals analysis (Forecast Methodology No. 8). Track accounts were not included in this analysis. Also, grading and tunnel bores were considered depreciable. The function of the actuarial analysis and the simulation analysis was to estimate appropriate survivor characteristics. Through the application of a survival curve and the renewals model, renewals were forecast for each year of the projection period. The depreciation expense for each year was developed by applying a depreciation rate, which was developed from the survivor characteristics and estimated salvage, to the depreciation base at the close of each year. The depreciation reserve for any given year was developed by adding the depreciation expense for that year to the reserve balance from the previous year and deducting service value.

Current assets and current liabilities (Forecast Methodology No. 11).—For forecasting purposes, current assets are broken down to cash receivables, materials and supplies, and other assets, while current liabilities are divided into loans and accounts payable, interests payable, dividends payable, taxes payable, and other liabilities.

Receivables for each district were projected with a regression equation using as an independent variable the sum of operating revenues, rental income, and other income. The regression analysis was performed over a historical series of 13 years (1962-74), assuming that when the collection cycle remains stable, the balance of receivables is dependent on the level of revenues. Regression analysis was also used in projecting materials and supplies as a component of current assets. In this regression equation, the sum of fuel, materials and supplies as components of operating expenses were used as an independent variable, assuming that the level of inventory would vary with operating needs. "Other assets" were projected by applying a ratio to operating revenues. The ratio is determined on the basis of its trend over the latest 5 years.

The projection for loans and accounts payable was also based on regression equations using cash expenses as an independent variable. Cash expenses consist of operating expenses minus depreciation and retirements plus tax and rental expenses. The underlying assumption was that with a stable payment cycle, the balance of payables would be related to expenses that require cash payments. Interest, tax, and dividend payables were projected separately in a proportionate relationship to interest expenses, dividend appropriations, and tax expenses. Other liabilities were projected by applying a ratio to operating revenues. The ratio of each district is determined by observing the trend over the latest 5 years.

With these current assets and liabilities projected, the net increase or decrease in cash balance was computed as a residue of the following: changes in net working capital (an item of the funds flow statement), and changes in the balance of the current assets and current liabilities mentioned above.

Since all projections were either based on revenues or expenses, there is no need to apply inflation factors to individual current assets and liabilities. They will be inflated if they are based on inflated revenues and expenses in the computation process.

Although all the regression analyses have shown high degrees of significance and association between variables, the figures derived can serve only as rough estimates. This is because the level of working capital and its financing are, to a great extent, subject to the management discretion of the individual companies.

Projection of minor items.—Minor items—i.e., balance sheet and income statement account balances which are either of little magnitude or which change over time mainly at the discretion of management—have been forecasted by any of four methods; (1) linear extrapolation of the historical trend, (2) projection of the historical average, (3) projection of a constant (base year) value, or (4) projection as percentage of another account (see appendix J, Forecast Methodology No. 17).

The use of projected funds flow analysis.—Projected funds flow analysis can assist the Commission in discharging its regulatory functions in general rate increase proceedings. The broad range of data generated through such analysis can be used to evaluate the evidence tendered in general increase proceedings and is complementary to the procedures promulgated in Ex Parte No. 290, *Procedures Governing Rail General Increase Proc.*, 351 I.C.C. 544 (1976). In addition, projected funds flow analysis will provide the Commission with a means to measure independently railroad revenue need for policymaking purposes.

The Ex Parte No. 290 procedures which are to become effective September 1, 1977, unless postponed or modified, require, among other things, the submission by the railroads of 1-year income forecasts based on what they believe their traffic levels will generate in the way of revenue and the cost of service associated with such business volume. At present, the Commission lacks the means for evaluating such forecast data because it possesses no data base of its own for comparative purposes. The projected funds flow model will largely solve this problem because it develops income forecasts embodying the same data elements and using essentially the same projection format required of the railroads in Ex Parte No. 290.[51] Thus, comparisons between the railroads' data and the ICC forecasts can be readily made for analytical purposes. In addition, by relating their revenue levels to their ongoing operational needs, funds flow analysis provides a framework within which the railroads' evidential case can be better interpreted and evaluated.

---

[51] The projected income statements generated by the model (the "B" schedules) contain forecast data for each of the 10 calendar years following the latest calendar year in which annual report data is available for all of the class I line-haul railroads. Depending upon the timing of the railroad general increase filing, either the first or the second forecast year of these projections will be equivalent to the forecast year used by the railroads in calculating their forecast year projections for columns (h) and (j) of the Schedule B income statement prescribed in Ex Parte No. 290 (see 351 I.C.C. 621).

The development and ongoing implementation of the Ex Parte No. 271 projected funds flow model has required and will continue to require computerization of a broad and extensive data base of relevant statistics and information, including Annual Report R-1 and quarterly CBS and RE&I data, whose assimilation into the data base will require, upon their filing, immediate processing and corrective editing. With this capability, the Commission has at its disposal a surveillance system which will allow it to monitor the railroads' revenue need posture on a continuous basis and provide a more meaningful perspective of the state of the industry and its finances. The Railroad Revitalization and Regulatory Reform Act of 1976 requires that the Commission develop this capability.

Section 205 of the 4R Act amends section 15a of the Interstate Commerce Act to require promulgation within 24 months of the date of enactment of standards and procedures for the establishment of railroad revenue levels adequate to sustain the carrier's ongoing needs in several critical areas. These areas are enumerated on the left-hand side of diagram III on page 1597.

DIAGRAM III

RAILROAD REVITALIZATION AND REGULATORY REFORM ACT OF 1976

STANDARDS / PROCEDURES FOR ASCERTAINING ADEQUATE RAILROAD REVENUE LEVELS.

SECTION 205 REVENUE REQUIREMENTS	XP-271 CAPABILITIES
1. COVERAGE OF OPERATING EXPENSES	1. INCOME AND EXPENSE PROJECTIONS
2. OBSOLESCENCE	2. PROJECTIONS OF RETIREMENTS AND EQUIPMENT NEEDS
3. FAIR/REASONABLE AND ECONOMIC PROFIT	3. COST OF CAPITAL STUDY
4. ADEQUATE CASH FLOW FOR CAPITAL OUTLAYS	4. FUNDS FLOW AND CAPITAL EXPENDITURE PROJECTIONS
5. ADEQUATE CASH FLOW FOR DEBT RETIREMENT	5. FUNDS FLOW AND DEBT RETIREMENT FORECASTS
6. PERMIT RAISING OF NEEDED EQUITY CAPITAL	6. COST OF CAPITAL AND FINANCIAL RATIO ANALYSIS
7. COVER THE EFFECTS OF INFLATION	7. ABILITY TO INFLATE PROJECTIONS
8. INSURE RETENTION OF CAPITAL	8. COST OF CAPITAL AND FINANCIAL RATIO ANALYSIS

On the right-hand side of the diagram are listed those elements of the Ex Parte No. 271 funds flow model which specifically address the various need areas. It becomes apparent from this chart that the projected funds flow model will address all of the procedural requirements imposed by section 205 of the 4R Act. The Coordinator recommends, therefore, that the model so developed be used as the basis for instituting the rulemaking required under section 205 of the 4R Act. In making this recommendation, however, the Coordinator fully recognizes the fact that the model, as presently constituted, is at a formative stage of development. Accordingly, further refinement and modification of the model can be expected as a necessary adjunct to the full development of its potential as an effective tool for defining railroad revenue need, both presently and prospectively. In this regard, it is recognized that there are several ways in which the model can be perfected. Among these is the possible development of procedures for measuring the impact of commodity hold-downs and carrier flag-outs from general increase proposals on the revenue needs of the railroads. Another area that could be explored is the elasticity of demand for rail service and the limitations such demand imposes upon the carriers' ability to apply general increases across broad segments of their traffic. Also worth considering is the development of standards and measurement criteria for determining the level of earnings required by the carriers to enhance their attractiveness to prospective investors and creditors as well as to develop stronger borrowing power. Other possible improvements include, but are not limited to, the development of procedures for estimating the impacts of plant modernization on carrier operating expenses and improved service quality on the demand for rail service. The new rulemaking effort required under section 205 of the 4R Act, it is anticipated, constitutes an excellent means for accomplishing these objectives.

Provision for new railroad accounting system.—Section 307 of the Railroad Revitalization and Regulatory Reform Act of 1976 amends paragraph (3) of section 20 of the Interstate Commerce Act to require the prescription of a uniform cost and revenue accounting and reporting system for all railroads subject to Commission regulation. Required by law to become effective no later than January 1, 1978, the accounting system so established will necessarily require a wholesale revision in the format and content of the Annual Report Form R-1 and the quarterly report forms, the media through which the financial results of rail operations are reported to the Commission annually. As the data base upon which the projected funds flow model functions is largely composed of annual report data, it is contemplated that a major effort will be required to bring the revenue and cost data generated by the new accounting system into the funds flow data base. It is also contemplated that major changes will have to be made to a number of the funds flow forecast methodologies to accommodate the revisions that will be made to the underlying data base. Of particular concern here will be the operating expense forecast methodology (appendix J, Forecast Methodology No. 3) which should benefit the most from the new cost accounting system. At present, the railroad annual report data upon which operating expenses are projected for funds flow purposes fails to account separately for the materials, labor, and overhead components which comprise many of the various operating expense accounts. The new accounting system, on the other hand, will provide for the separation of these components, thus offering the Commission a more reliable means in the future for projecting key operating expense items. It is with this prospect in mind that the Coordinator recommends that the separate rulemaking proceedings required under sections 205 and 307 be coordinated. The objective to be served from this continuous, coordinated effort is to assure the development of the best possible data base for determining adequate railroad revenue levels, as well as for meeting our other regulatory responsibilities.

Organization of special funds flow group.—Further refinement and modification of the funds flow model, whether it occurs within the framework of a separate rulemaking or is accomplished in the normal course of Commission business, will necessarily require the additional commitment of funds and manpower. The Coordinator recommends, therefore, that a special funds flow group, separate and distinct from any office or bureau within the Commission, be established for these purposes. The work of this group is perceived to be a permanent, not temporary endeavor. The development and refinement in the model along the various lines previously discussed in this report will require a continuous and full-time effort on the part of those individuals assigned to the group. Such a commitment of Commission resources, it appears, is contemplated in section 205 of the 4R Act.

Analysis of funds flow results.—The projected funds flow model was intended as a way of responding to the question of how much net revenues the railroads need—after granting general revenue increases to account for the impact of inflation on operating expenses—to meet their capital expenditure and other requirements, thereby remaining financially healthy and capable of meeting the public needs for service. What do the results of the funds flow study imply in respect to the magnitude of those revenue needs? Do these results appear realistic? Are the implied revenue needs within the limits reachable by, say, one-time general increase in revenues? What can be said about regional differences in the revenue need outlook?

Consider first the underlying (inflated dollar) projections of revenues and expenses. As compared with the historical 1966-75 period, the average operating ratio for the 1976-85 forecast period is about 1 percentage point higher for the East less bankrupts and ConRail group and for the South, and 2 percentage points lower for the West less Rock Island. Generally, though, there is some declining tendency over time in the ratios (particularly after accounting for cyclical changes), with the eastern and southern ratios starting higher than the historical averages.

Two factors peculiar to the type of projection conducted here could account largely for this pattern. For one thing, normalized track maintenance starts relatively high as a ratio to freight revenue and declines over the forecast period. Over time, these track expenditures vary little (in constant dollars), while traffic density builds up; track miles are projected to continue declining slightly. On an inflated dollar basis, the ratio to freight revenue for the East less bankrupts and ConRail group drops from .0552 in 1976 to .0477 in 1985; for the South the corresponding drop is from .0776 to .0651, and for the West less Rock Island from .0667 to .0506. Similarly, depreciation—being calculated on the basis of projected capital expenditure needs—is relatively high as a ratio to operating revenues, and the ratio generally declines over the forecast period (not for the South, however, where it increases from an already high level of .06 to .07 as compared with a 1974 level of .054).

Both the projected constant dollar labor compensation expenses and the projected wage rate subsume a moderate dwindling of labor productivity gains over time. Combining the East less bankrupts and ConRail, South, and West less Rock Island, revenue ton-miles per constant dollar compensation increase 2.8 percent per year from 1976 to 1981, whereas it is estimated to have actually increased 3.1 percent per year from 1969 to 1974. Traffic growth is greater, however, for the 1976-81 period—5.5 percent per year, as compared with 2.8 percent for 1969-74. The regions differ significantly in projected traffic growth rates for the 5-year period—5.2 percent for the East less bankrupts, 4.9 percent for the South, and 5.8 percent for the West less Rock Island.

Dwindling productivity gains are consistent with either an arrest in service quality deterioration or a reduction of opportunities for labor savings because of insufficient replacement of antiquated facilities with modern, automated facilities—two seemingly contradictory explanations. Certainly the funds flow model presumes maintenance of service quality. While labor savings are likely from stepped-up replacement investment, these savings are not quanitified.

Generally, the operating expense projection bases do not capture the complex mechanism actually determining the level of operating expenses—the seemingly arbitrary cutbacks made in times of stringent liquidity, the various fixed and variable functional activities, et cetera. Quantifying such influences should be the goal of future research to improve the model. For now, it is important, in measuring long-term revenue needs, to estimate *net* cash flow on a reasonably reliable basis. The historical stability of operating ratios and of compensation to freight revenue ratios offer guideposts for evaluating and selecting expense projections that yield the most reliable estimates of net cash flow available (and the additional amount needed) for covering capital expenditures.

Another way to view the projected operating ratios is to recompute them by adding to revenues the projected shortfall of funds. Actually, the shortfall could, and most likely would, in part be made up by operating expense savings rather than sheerly by additional revenues. Nonetheless, recomputing the operating ratio this way yields results lower than the historical 1966-75 average, which for the three groups reported here was .773. For 1976 the recomputed ratio is (on an inflated dollar basis) .719 and for 1980, .723. These results allow one to evaluate the adequacy of actual operating ratios in terms of overall financial needs of the carriers.

As a percent of freight revenues, the projected funds shortfall seems within reach of feasible increases in revenues or operating expense savings from technological change or a combination of both. For the three groups reported here combined, the percentage (computed on an inflated dollar basis) drops from 9.76 in 1976 to 4.22 in 1980 and 6.06 in 1985.

Schedules F (Shortfall Elimination Schedules) in appendix K provide another approach to evaluating the shortfalls. There, a one-time percent increase in revenues or percent decrease in expenses is computed that eliminates cumulative shortfalls over the 1977-85 period. On an inflated dollar basis, the percentage increases in operating revenues required is 4.7 for the eastern group, 7.9 for the South, 2.7 percent for the western group, and 4.1 for the three groups combined. Required percentage reductions in operating expenses are 6.0 for the eastern group, 10.4 for the South, 3.5 for the western group, and 5.4 for the three groups combined.

Regional differences are notable, the South standing out vis-a-vis the East less bankrupts and ConRail and the West less Rock Island. At this stage, however, it must be underscored that regional results are not as reliable as the combined totals for the groups because (a) in contrast to past experience, general revenue increases and the underlying trends in constant dollar revenue per ton-mile (affected by commodity mix and other factors) are assumed to be the same for all regions, and (b) the methodology followed, in retrospect, allocates too great a portion of equipment expenditures to the South, considering the limited traffic growth projected for the region as compared with traffic growth for the West less Rock Island.

On the surface, an increase in freight rates of 4-9 percent does not seem to be outside the grasp of the railroads, even though it would be over and above general increases requested to offset operating expense increases due to inflation. But recent experience shows that even the ordinary general increase to keep pace with operating expenses is most difficult for the railroads to apply without diverting so much traffic to competing modes as to make the increases self-defeating. In this light, it becomes all the more important to look to improved efficiency from plant modernization as a source for making up the projected funds shortfall. Other potential sources are (within limits) guaranteed loans and light density line subsidies.

To what extent can the Commission's general increase policy to offset inflation in operating expenses be expected by itself to meet capital expenditure and other financial needs under expected long-term inflationary conditions? One indication is the percentage of funds shortfall to freight revenue computed on the basis of constant dollar projections. As just noted, computed on an inflated dollar basis (i.e., including revenue level increases to cover operating expense increases due to inflation) the percentage drops from 9.76 in 1976 to 6.06 in 1985 for the three reported groups combined. On a constant dollar basis, the comparable drop is from 9.88 to 6.68, or nearly the same as the percentage computed on an inflated dollar basis. It would thus appear that short-term general increase policy, as might be expected, makes little contribution toward reducing the additional revenue needs for adequacy in long-term financial conditions. By the same token, though, the short-term increase policy does not result in a widening gap so far as inflation of capital goods items is concerned.

The assumed pattern of short-term general increases leads, actually, to projected operating ratios that are on the average over the 10-year forecast period about 2-percent lower on an inflated dollar than on a constant dollar basis except for the East, where they are about the same.

So far the discussion has treated the funds shortfall as the measure of additional revenue need for long-term financial viability. Actually, revenue levels must—in order to meet long-term financial needs—not just suffice in terms of liquidity to make the needed outlays for capital expenditures. They must also yield an adequate return on those expenditures. Since interest charges in the funds flow model represent the return to holders of debt instruments, one can examine this need for adequate return in terms of the return on stockholders' equity, and consider, *e.g.*, what additional revenue needs would be engendered by a required return on equity of 9 percent.

The more conventional measure is rate of return on net investment in railroad property. Without making up the shortfall, these rates of return would be on the average over the forecast period similar to historical levels. For 1976-85 the rates of return are 2.85, 3.97, and 5.13 for the East less bankrupts and ConRail, South, and West less Rock Island (on the basis of inflated dollar figures), respectively. The comparable figures for 1973-75 are 2.85, 4.81, and 4.04 (all affected by subnormal 1975 results).

Adding the projected funds shortfall (in inflated dollars) to net railway operating income, one obtains the following rates of return for the three groups reported here:

	1976	1980	1985
East less bankrupts and ConRail	6.57	6.91	5.75
South	11.88	9.20	8.74
West less Rock Island	6.81	7.46	7.45

Though these returns would provide the needed liquidity, one must look further to determine whether something in addition is needed to yield an adequate return on internally generated funds invested in carrier operations.

On last caveat to the interpretation of projected funds shortfalls is that these have been computed on an aggregate regional basis. There is aggregation bias to the extent the roads accounting for most uses of funds do not correspond to those accounting for most sources of funds.

DISCUSSION AND CONCLUSIONS: ALTERNATIVES AND SUPPLEMENTS TO RATE BASE/RATE OF RETURN—FUNDS FLOW ANALYSIS

Ultimate findings and conclusions

1. The Coordinator finds that the present original cost net investment rate base should be retained and that there is no evidence of record justifying significant writedowns of net investment base.

2. The Coordinator finds that straight-line depreciation as presently adminstered by the Commission should be retained. The Coordinator also finds that presently stated depreciation reserves are adequate and are similar to what they would have been had ratable depreciation been followed.

3. The Coordinator recommends that a rulemaking proceeding be instituted to provide for depreciation studies being initiated and prepared by the railroads for review by the Commission. In this same vein, the Coordinator advocates continued research into the updating of the Commission's depreciation data base and the processes used to analyze depreciation. Furthermore, the Coordinator recommends adoption of a 3-year cycle for the complete review of the depreciation rates and accrued depreciation accounts pertaining to a railroad's road and equipment property.

4. To facilitate continued research in depreciation methodologies, the Coordinator recommends that the Commission conduct depreciation feasibility studies and develop depreciation schedules.

5. The Coordinator recommends that accounting rule changes be considered by railroad management, the accounting profession, the Commission, and other governmental agencies to make accounts 2 1/2, 3, 5, and 39 fully depreciable.

6. The Coordinator rejects the railroads' suggestion to include the net debits in account 80, Other Items of Investment, in the net investment base. The Coordinator also rejects as untenable the SPC suggestion to include the account 80 credits, but to exclude the debits.

7. The Coordinator rejects modification of account 76, Interest During Construction, to impute interest on equity funds employed in construction projects. The railroads' suggestion to include account 90, Construction Work in Progress, in the rate base is also rejected.

8. The Coordinator recommends acceptance of the SPC's suggestion to use the Commission's Cost and Valuation Section's Rail Form A working capital allowance formula instead of the traditional formula espoused by the railroads.

9. The average, yearend and beginning-of-year rate base determinations are appropriate for different purposes. The Coordinator recommends continued use of all three methods.

10. The Coordinator finds that a 6- to 10-percent overall target rate of return would not be unreasonable under present conditions. Such a rate of return should be a goal of the railroad industry, not a guarantee by Government.

11. The Coordinator believes that in view of the study required by section 903 of the Railroad Revitalization and Regulatory Reform Act of 1976, findings on the issue of the impacts of diversification and conglomeration upon railroads in this proceeding would be premature.

12. The Coordinator finds that both the deferred tax and flow-through methods of accounting for Federal income taxes should be considered in assessing the financial condition of the Nation's railroads.

13. The Coordinator believes that the separation of account 532, Railway Tax Accruals, into rail operating and nonrail capital-related items should be accomplished as part of the major revision of the rail system of accounts now under way.

14. The Coordinator finds that railroad dividends have not been shown on this record to be excessive.

15. The Coordinator recommends an inflation adjustment to financial data through the use of constant as well as actual dollars on both a general and a specific price basis for use in assessing the financial condition of the railroad industry.

16. The Coordinator recommends adoption by the Commission of funds flow methodology to evaluate railroad revenue need in general rate increase proceedings and to otherwise assist it in discharging its responsibilities under the act.

17. The Coordinator recommends the establishment of a special funds flow group for further development, refinement, and interpretation of funds flow data.

18. The Coordinator recommends that use of the funds flow methodology be considered in the new proceeding required by section 15a(4) of the act, as amended, for the establishment of standards and procedures for the determination of adequate revenue levels.

19. The Coordinator finds that this report does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969.

It is ordered, That this proceeding be, and it is hereby, held open for further order of the Commission.

APPENDIX A

TABLE OF CONTENTS

Special projects counsel's submission

Page

SPC's findings on railroad profitability ---------- 1609

SPC suggests adjustments to the Commission's calculation of net railway operating income ---------- 1611
  Tax accruals: Rail operations ---------- 1611
  Deferred taxes should be excluded ---------- 1611
  Adequacy of depreciation reserves ---------- 1611

SPC suggests a uniform method for computing book value rate base for 1972 ---------- 1612

SPC finds an overvalued rate base ---------- 1615
  Account 80 ---------- 1615
  Other indicia of overvaluation ---------- 1617

SPC concludes that a substantial revaluation and writedown of the rate base is not presently feasible or practicable ---------- 1619

SPC suggests interim "guides" to fair railroad earnings in a period for which there can be no "definitive" rate base ---------- 1619
  Roadway return ---------- 1621
  Equipment return ---------- 1621
  Overall rate of return ---------- 1622

SPC contends that maximum rates of return of 4.26 to 4.83 percent will fulfill the railroads' funds flow needs ---------- 1623

SPC recommends new managerial and regulatory policies to arrest and reverse the decline of the railroads ---------- 1624

APPENDIX A

Special projects counsel's submission

The Special Projects Counsel (SPC) has concluded that the present book value railroad rate base is substantially overvalued and that, because of this, what would ordinarily be considered a normal or desirable fair rate of return on the present net investment rate base is not a proper index of needed earnings. However, SPC indicates that the degree of overvaluation cannot be precisely calculated within the context of this proceeding because of time and financial limitations. In other words, a "used and useful" inventory valuation of railroad property was not conducted. The SPC did, however, calculate what he felt would be a reasonable rate base and a rate of return for use as "guides" during the pendency of any used and useful or other method of decreasing what he considered to be an overvalued rate base. He concluded that the following 1972 net investment book value rate base would be appropriate for interim guideline purposes:

District	Book value net investment base
	(in millions)
Eastern	$10,217.7
Southern	4,711.3
Western	12,064.4

SPC then attempted to calculate a return composed of an element to serve as a fair return on embedded roadway capital and an element to attract new equipment financing. The following interim rates of return were recommended:

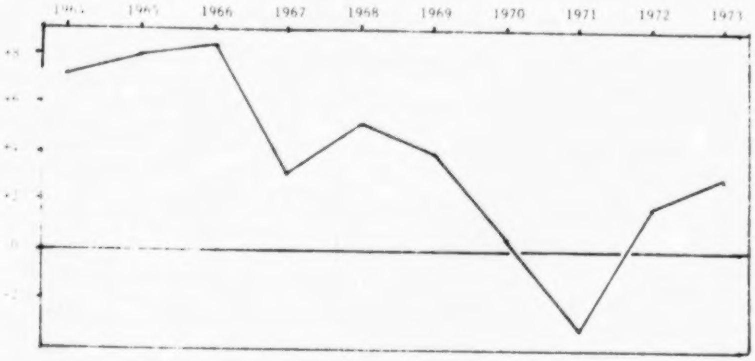
District	Recommended allowable maximum rates of return
	Percent
Eastern	4.26
Southern	4.83
Western	4.70

The SPC concluded that an adequate flow of funds to the carriers would have been provided through such interim rates of return on the above-stated interim rate base for the period 1971 to 1973. The SPC dealt with a number of other related topics which are summarized below under appropriate headings.

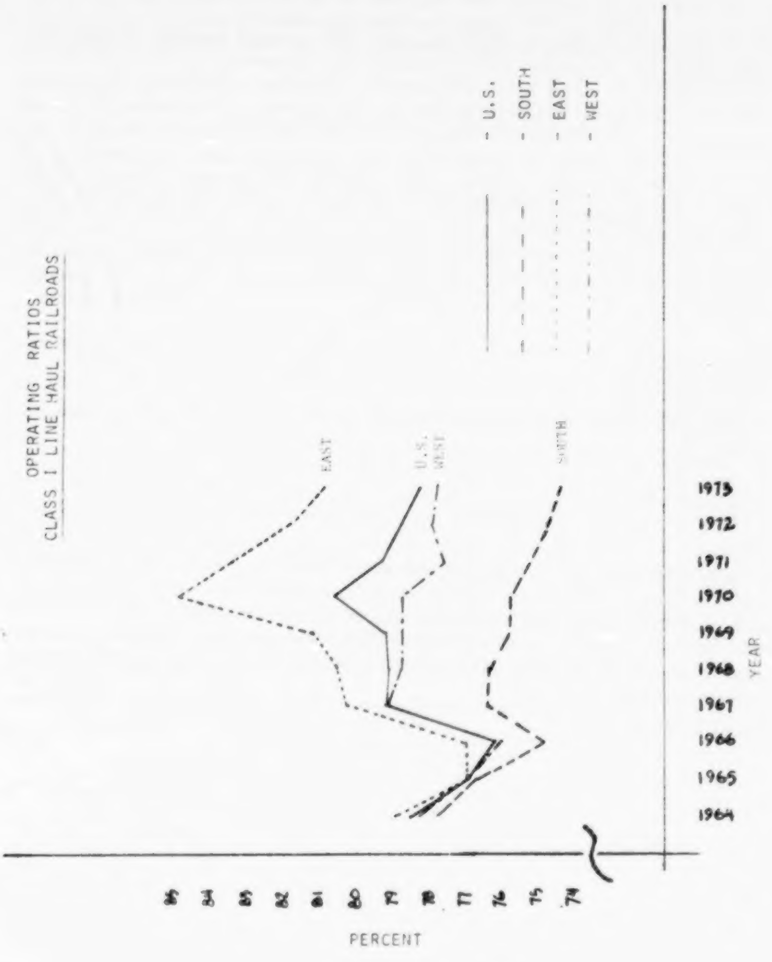
SPC'S FINDINGS ON RAILROAD PROFITABILITY

The SPC noted that, while rail operating revenues increased 50 percent from 1964 to 1973, such revenue increases were fully offset by operating expense increases of 50 percent. From 1964 to 1973, freight ton-miles increased 29 percent, however, net income showed "an equally consistent decline," over the same time span, as shown in the table below:

NET INCOME AS PERCENT OF RAILWAY OPERATING REVENUES



He concluded that the decline in profitability was not attributable to operating excessive service, either in the form of empty back-hauls, other nonrevenue services, or more frequent trains and equipment than necessary. He noted for the South and West that rail profitability was enhanced by the operation of fewer, longer and heavier trains. A review of operating ratios by district shows the following, with the highest ratios in the East:


OPERATING RATIOS
CLASS I LINE HAUL RAILROADS
U.S.
SOUTH
EAST
WEST
EAST
U.S.
WEST
SOUTH
1973
1972
1971
1970
1969
1968
1967
1966
1965
1964
YEAR
85
84
83
82
81
80
79
78
77
76
75
74
PERCENT

The SPC found that combined net equipment rents and fixed charges increased from 1964 to 1973 by about 96 percent. He suggests that a reduction in fixed charges through a reduction in overall plant could have relieved the declined profitability of the railroads.

SPC SUGGESTS ADJUSTMENTS TO THE COMMISSION'S CALCULATION OF NET RAILWAY OPERATING INCOME

Net railway operating income has been used as the numerator in rate of return calculations and has been computed as follows:

Computation of net railway operating income

Formula	Account No.	Description
1. Begin with	501	Railway operating revenues
2. Subtract	531	Railway operating expenses
3. Balance (line 1 - line2)		Net revenue from railway operations
4. Subtract	532	Railway tax accruals
5. Balance (line 3 - line 4)		Railway operating income
6. Add	503-508	Rent income
7. Subtract	536-541	Rents payable
8. Balance (line 6 - line 7)		Net rents
9. Balance (line 5 - line 8)		Net railway operating income

Net railway operating income reflects the so-called "above the line" results of operations. Nonoperating income and expenses are so-called "below the line" items which do not relate to the production of income from rail operations. This proceeding is concerned only with rate of return and rate base of rail operations. The SPC recommends that "above the line" income continue to be the numerator subject to certain adjustments.

Tax accruals: Rail operations.—SPC recommends that account 532, Railway Tax Accruals, be separated into those taxes properly associated with rail operations and those which are properly associated with nonrail activities. He suggests that there may well be an "highly significant" overstatement of taxes accrued to rail operations for individual railroads, nevertheless SPC believes that this problem is not significant region by region. In particular, SPC recommends that a separate schedule be included in the Commission's Annual Report Form R-1 (1) to provide a breakdown of the income tax computation, and (2) to show to what extent income taxes paid in any year are attributable to "below the line" capital gains.

Deferred taxes should be excluded.—SPC notes the recent adoption by the Commission of the so-called deferred tax method of accounting for financial reporting purposes.[1] SPC urges that the deferred method not be adopted for ratemaking purposes. He feels that today's ratepayers should not be required to bear the burden of possible future tax increases under the deferred method.

Adequacy of depreciation reserves.—SPC recommends that the amounts presently recorded as depreciation reserves be tested through a study which is presently being made by the Commission's Bureau of Accounts. Preliminary results have been released in an interim Coordinator's report dated March 3, 1975, in Ex Parte No. 271, *Net Investment—Railroad Rate Base & Rate of Return*, 345 I.C.C. 410 (1975). SPC reserves further comment on the staff study until the final results are made public.

---

[1] 49 CFR 1201 § 1-11(d)

SPC SUGGESTS A UNIFORM METHOD FOR COMPUTING BOOK VALUE RATE BASE FOR 1972

In attempting to construct a uniform net investment rate base for 1972, SPC found that three methods of computing rate base have been used by the Commission. As shown in the table below, the differences are not great:[2]

Experienced industry rates of return under alternative methods of computation (Class I line-haul railroads)

Year	Ex Parte No. 267	Cost finding	Annual[1] report
1966	3.90	3.90	3.92
1967	2.46	2.47	2.48
1968	2.44	2.48	2.52
1969	2.36	2.37	2.38

[1] *Annual Report, 1970*, 134; *Annual Report, 1971*, 122.

SPC also recommends that a change be made in the Annual Report Form R-1 (1) to revise Schedule 211 N-1 to include space for totals in accounts 80 and 90, and (2) to revise 211 N-1 or N-2 so that rate base may be calculated without resort to other schedules. SPC recommends that a particular year's rate base should be an average of beginning and ending balances rather than a yearend investment figure. This is said to be more representative of the investment over a year period. He would adjust the amount of working capital included in the rate base to the lesser of (1) an amount "needed" based on a method used by the Commission's cost and valuation section, or (2) the actual amount. This would tend to avoid inclusion of what SPC considers excessive amounts of working capital in the rate base.

SPC recommends the inclusion in the net investment base of the credits in account 80, Other Elements of Investment. He feels that the credits should be treated as if they were a valuation reserve (reducing the rate base), because the writedowns of capitalization involved were largely the result of railroad reorganizations in the 1930's where capitalization was written down to a value more nearly reflecting earning power. SPC would include the credits in account 80 for the additional reasons that such credits reflect "unsupported" writeups of previous-to-1910 asset values to the 1910-1914 valuation basis (used by the Commission pursuant to section 19a of the Interstate Commerce Act) and because such credits represent donations of land.

SPC would exclude the *debits* in account 80 which are, among other things, writedowns of previously recorded asset values to the 1910-1914 valuation basis, relying on part of the decision in Ex Parte No. 259, *Increased Freight Rates, 1968, supra*, 604, that account 80 debits represent unsupportable items not properly includable in net investment base. The Ex Parte No. 259 method permitted the netting of debits against credits with any debits remaining in account 80 as an addition to net investment base. However, SPC would exclude any remaining debits as unsupportable.

---

[2] The differences are explained in greater detail in SPC exhibit 17 and *infra* appendix B.

SPC also believes that account 90, Construction Work in Progress, should be excluded because items in this account are not yet in transportation service and thus should not be properly included in the rate base. Nevertheless, SPC, NIT League, and General Mills agree that the carrying cost of funds committed to and expended on construction projects should be allowed in the rate base in a modification of account 76, Interest during Construction, although the construction funds themselves in account 90 should not be allowed. This is based on a traditional regulatory policy that today's ratepayers should be required to support only capital investment currently used in transportation service. In account 76 the carriers are currently required to show only interest paid on debt funds used during construction. The SPC recommends revision of this account to also include an imputed interest cost on equity capital tied up during construction, at an appropriate imputed interest rate.

Considering all these adjustments, the SPC recommends the following as an appropriate rate base for 1972, nationally and by district:

Book value net investment base, 1972 class I line-haul railroads
(In thousands)

	All Districts	Eastern	Southern	Western
Schedule 211N-1 (Column d-column e)	$27,202,566	$10,304,713	$4,745,133	$12,152,720
Less:				
Account 80 Dr	699,877	216,060	102,838	380,979
Account 90[1]	146,331	46,347	29,204	70,780
	6,279	4,737	652	890
Plus:				
Working capital	643,034	180,151	98,586	364,297
Average NIB	26,993,113	10,217,720	4,711,025	12,064,368

[1] Respondents are shown separately from the lessor and proprietary railroads.

He accordingly recommends that the following be determined as earned rates of return for 1972 on the suggested rate base:

Return on the book value net investment base (NIB) class I line-haul railroads 1972

	All districts		Eastern		Southern		Western	
	Amount		Amount		Amount		Amount	
	(000's)	*Percent*	*(000's)*	*Percent*	*(000's)*	*Percent*	*(000's)*	*Percent*
1. Average NIB	$26,993,116		$10,217,720		$4,711,025		$12,064,371	
2. NROI	827,682		38,638		258,763		530,281	
3. Return on NIB		3.07		.38		5.49		4.40
4. NIB paid by debt	11,513,039		5,003,303		1,931,246		4,578,490	
5. Percent of NIB paid by debt		42.65		48.97		40.99		37.95
6. Interest expense	555,292		231,201		105,051		219,040	
7. Return (6 ÷ 4)		4.82		4.62		5.44		4.78
8. Leased NIB[1]	2,248,208		1,923,614		205,261		119,333	
9. Percent of NIB leased		8.33		18.83		4.36		.99
10. Rental expense	62,002		48,506		11,727		1,769	
11. Return (10 ÷ 8)		2.76		2.52		5.71		1.48
12. NIB paid by equity	13,231,869		3,290,803		2,574,518		7,366,548	
13. Percent of NIB paid by equity		49.02		32.21		54.65		61.06
14. NROI available for stockholders	210,388		-241,069		141,985		309,472	
15. Return on equity (14 ÷ 12)		1.59		deficit		5.52		4.20

[1]Source: SPC exhibit 19.

SPC FINDS AN OVERVALUED RATE BASE

The SPC assumes that there is a great deal of overvaluation in the railroad rate base which he concedes he has not precisely quantified. He cites the railroad's brief in I. and S. No. 8038, *Ingot Molds From Pennsylvania to Steelton, Ky.*, 323 I.C.C. 758 (1965), for the proposition that excess capacity exists. This is in the sense that more trains could be operated on certain rail rights of way. SPC goes on to discuss the multiplicity of open rail routes that exist and cites a comprehensive transcontinental example showing a potential 36,554 open routes from San Francisco to New York via only one of a number of gateways, Chicago. He questions the economic need for the circuity that is evident in some of these routes. Circuity ranges up to 30 percent for the San Francisco-New York example. A Boston-Atlanta example developed circuity of up to 58 percent. SPC also cites the Secretary of Transportation's "1972 National Transportation Report" as a comprehensive discussion revealing some of the dimensions of the excess capacity problem.

Additional evidence of overvaluation is provided, according to the SPC, through the number of voluntary writedowns of rail property taken by various railroads in connection with purchases or mergers. For the period from 1968 to 1972, the SPC noted that the Commission had approved over $1 billion in writedowns of book value for various carriers. A table follows:

Examples of voluntary reduction of the net book value of transportation property

	Million
I. Purchases	
A. Delaware & Hudson Ry. Co. (1968)	$41.8
B. Erie Lackawanna Ry. Co. (1968)	185.0
C. New York, New Haven & Hartford RR. Co. (1968) by Penn Central Transportation Co.	109.5
D. Chicago & North Western Transportation Co. (1972)	362.8
E. Gulf, Mobile & Ohio RR. Co. by Illinois Central Gulf RR. Co. (1972)	70.7
Writedowns on purchases	769.8
II. Mergers accounted for as poolings of interest	
A. Pennsylvania RR. Co. and New York Central RR. Co. into Penn Central Co. (1968)	126.2
B. Chicago, Burlington & Quincy RR. Co., Great Northern Ry. Co., and Northern Pacific Ry. Co. into the Burlington Northern (1970)	200.5
Writedowns on mergers	326.7
Total on purchases and mergers	1,096.5

The SPC suggests that the size and geographic dispersion of these railroads indicates that a large potential writedown exists throughout the industry.

Account 80.—The SPC further cites account 80, Other Elements of Investment, as additional evidence of an overvalued rate base in an amount in excess of $1.0 billion. SPC shows four major sources of account 80 entries: (1) writedowns of capitalization, (2 and 3) writedowns and writeups required by the Commission's 1963 order to conform then-existing book costs with the Commission's valuation records at 1910-14 reproduction cost level, and (4) a source reflecting donations and grants. The amounts from the four major sources of account 80 entries are set forth below:

Summary of the entries in account 80, 1937-1963 class I line-haul railroads[1]
(In thousands)

	East	South	West	U.S. total
Reflecting writedowns in capitalization (cr.) (see SPC exh. 24)	$105,792	$203,161	$465,511	$774,464
Reflecting writedowns in asset book values to the 1910-14 reprod. basis (dr) (see SPC exh. 25)	294,125	89,085	911,602	1,294,812
Reflecting writeup of asset book values to the 1910-14 reprod. basis (cr.) (see SPC exh. 26)	164,389	92,082	42,527	298,998
Reflecting donations and grants (cr.) (see SPC exh. 27)	60,508	32,208	188,012	280,728

[1] For railroads that existed in 1972.

SPC recommends that the Commission scrutinize the clearances since 1963 in account 80. He recommends that the writedown clearances be fully preserved for rate base purposes, in the amount of about $700 million in debits at the end of 1973. SPC proposes to do this by excluding account 80 debits from the net investment base.

The clearances of the credits, however in his view, "present a more serious problem." Some of these entries reflect a reversal of a previous writedown, thus restoring the capitalization. SPC believes that these clearances should be taken against the property accounts to preserve a reduced property value. He estimates the overvaluation of rate base due to clearances of account 80 credits as follows:

	In thousands
Reflecting writedowns in capitalization (see p. 49)	$774,464
Reflecting writeup of asset book values (see p. 49)	298,998
Total	1,073,462
Less: Credit balances in 1972	[1]328,228
Clearances to date	745,234
Clearances to the property accounts (see SPC Exh. 23)[2]	337,104
Questionable clearances for rate base purposes	408,130

---

[1] The figure is $410 million for class I line-haul carriers, including the lessors and proprietary companies.

[2] This figure reflects the clearances for those carriers which had some balance in account 80 in 1972. At least another $60 million had been cleared to the property accounts by other carriers prior to 1972.

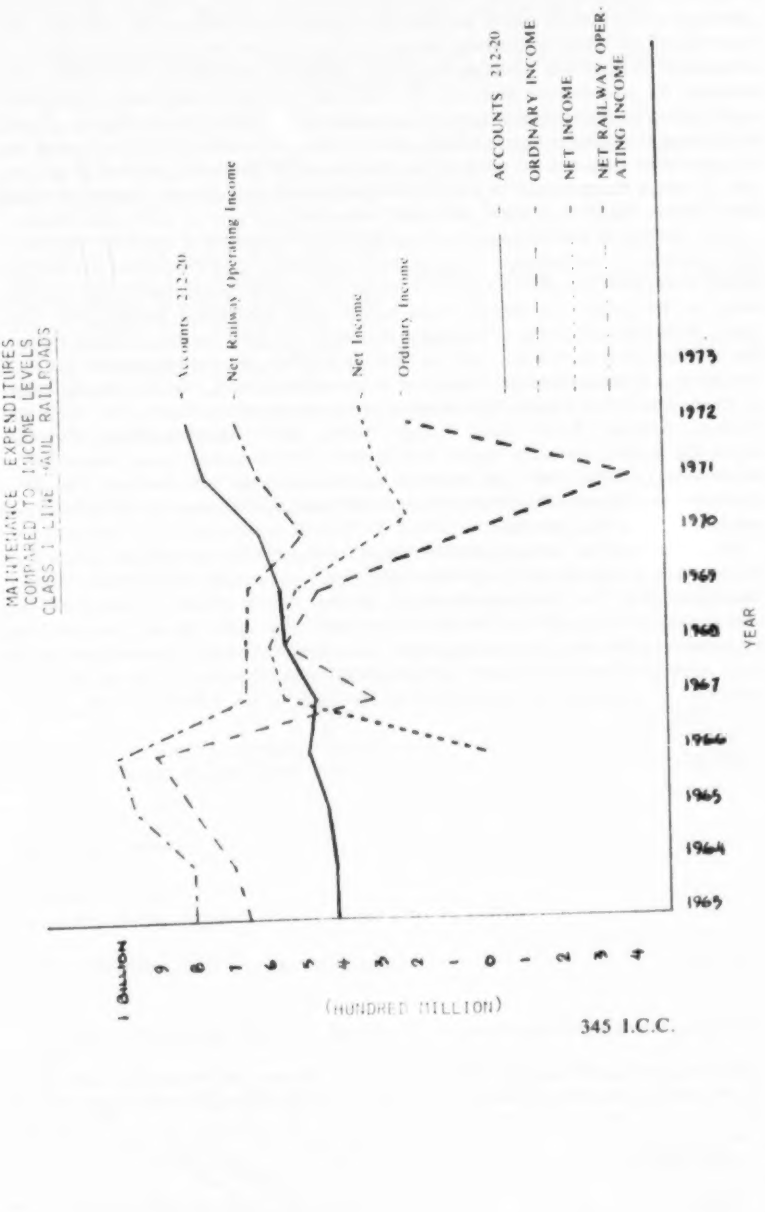
In conclusion, SPC estimates total overvaluation of rate base due to debits and credits in account 80 in excess of $1 billion, representing about $700 million in debits and about $400 in credit clearances to nonproperty accounts. SPC contends that there is still more overvaluation due to account 80 transactions. He argues, for example, that there should be lower ratemaking valuations than some of the values established for reorganization purposes, claiming that these values do not reflect a used and useful standard. He recommends that the lower of prior-to-1910 original cost or used and useful values be established in lieu of any existing higher 1910-14 reproduction values established through the Commission's basic valuation procedures. He notes that for reorganization purposes the predecessor of account 80[3] seemed to inherently assume that all assets being valued in a reorganization would be replaced, instead of using lower values based on a used and useful standard.

Other indicia of overvaluation.—Other tests for overvaluation made by SPC were unconvincing or inconclusive. They include the observation that there has been a drastic reduction in market value of railroad stocks and bonds, indicating that the value of rail assets has already been substantially discounted by investors. The fundamental earning power of rail assets is questioned. SPC accepts railroad witness Foster's data showing for the 1961 to 1970 period that the average market price of railroad stocks was only about 52 percent of the corresponding recorded equity value on the books. SPC's witness Weathersbee examined market-to-book value ratios for Southern Railway, Rock Island, Lehigh Valley, and Erie Lackawanna. For the financially weaker lines, the ratios vary within a fairly narrow range considerably below average book value; the stronger line's ratios vary more widely. The SPC concluded that Weathersbee's "data were too inconclusive to serve as an index of the overvaluation of the rate base."

Two additional tests made by the SPC included the effect of betterment accounting for certain primary accounts and the effects of a court case, *Democratic Central Committee of D.C.* v. *Washington M.A.T. Com'n.*, 485 F. 2d 786 (C.A.D.C. 1973), cert. denied 415 U.S. 935 (1974). SPC concludes that under either betterment or depreciation accounting, rail management could manipulate cash expenditures to an equal degree for maintenance and capital expenditures. However, he found no "direct evidence" of manipulated expenditures as set forth in the following chart:

---

[3] Former account 734.


MAINTENANCE EXPENDITURES
COMPARED TO INCOME LEVELS
CLASS 1 LINE HAUL RAILROADS
Accounts 212-20
Net Railway Operating Income
Net Income
Ordinary Income
ACCOUNTS 212-20
ORDINARY INCOME
NET INCOME
NET RAILWAY OPERATING INCOME
1 BILLION
9
8
7
6
5
4
3
2
1
0
1
2
3
4
(HUNDRED MILLION)
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
YEAR

SPC expresses the view that the Bureau of Accounts' current study of the adequacy of depreciation reserves "will suggest solutions in this area."

In *Democratic Central Committee* the Court was concerned with legality of a transfer to nonoperating status of real estate assets once used in transportation service. These real estate assets had appreciated and the central question concerned who should benefit from the appreciations, the ratepayers or investors. The Court concluded that salemaking involves a balancing of investor and consumer interests. Investors must be entitled to a fair rate of return; consumers must be protected from unreasonable rates. *Democratic Central Committee, supra,* 806.

The SPC concludes that while the principles of the *Democratic Central Committee* case are applicable to railroading, the facts and the equities are not. SPC believes that the Commission's accounting rules provide a consistent treatment of gains and losses, thus protecting the ratepayer from below-the-line losses, yet allowing the above-the-line gains on depreciable property to be taken to the ratepayer's benefit. SPC further believes that the inflated earnings picture and the leveraged purchase found by the court in *Democratic Central Committee* do not exist in railroading, thus the equities of the *Committee* case are also not applicable to railroading.

SPC CONCLUDES THAT A SUBSTANTIAL REVALUATION AND WRITEDOWN OF THE RATE BASE IS NOT PRESENTLY FEASIBLE OR PRACTICABLE

The SPC concluded that, while he views the rate base as substantially overvalued, it cannot be sufficiently quantified with the necessary precision to equal a "used and useful" rate base and that a writedown of asset values is "not feasible or practicable at this time." He concludes that a used and useful study would require a physical valuation of rail properties and a necessarily judgmental determination of the need for, and the usefulness of, particular assets. SPC's witness Winfrey concludes that such a study would be "a most complicated and extensive task requiring years of effort and millions of dollars." SPC also cites the 1920's-era $200 million cost of the Commission's basic valuation of rail property undertaken under section 19a during the period from prior to World War I to the early 1930's. The more recent United States Railway Association valuation studies on the northeast and midwestern bankrupts have cost approximately $4.8 million as of August 1974, according to the SPC.

Nevertheless, the SPC suggests that traffic density data may provide a useful guide to valuation. This data is not filed with the Commission at this time, but is internal to rail management. Such data is used by rail management in making decisions on maintenance and capital expenditure levels. SPC notes that the railroads have voluntarily supplied such data to the Secretary of Transportation for use in a report entitled "Rail Service in the Midwest and Northeast Region," February 1, 1974, which found what it considered to be a great number of "potentially excess" lines based on low density of use. That report's conclusions are under review in the northeast and midwest rail planning process presently under way. SPC concluded, however, that the use of density as a measure of valuation was beyond the capacity and budget of his office.

SPC SUGGESTS INTERIM "GUIDES" TO FAIR RAILROAD EARNINGS IN A PERIOD FOR WHICH THERE CAN BE NO "DEFINITIVE" RATE BASE

SPC suggests that in the absence of a used and useful rate base that "the fair rate of return on book value rate base must become a new concept in rate regulation." The heart of the SPC's views on rate of return are set forth as follows:

> At the outset, we recommend a new and highly important role for the rate of return in railroad rate regulation. We urge that regional rates of return be developed as guides for the maximum general rate increases the Commission will allow. At the same time, we urge that ***no maximum*** be established at this time on the rate of return on individual railroads; and further that ***no maximum*** be established in advance for any region that can be attained without rate increases through changes in investment and greater efficiency of operations.
>
> In the ordinary utility case, a rate of return serves as the maximum limit on the allowable earnings of the regulated company; and rate reductions are in order if earnings exceed that limit. [Footnote omitted.] We have concluded that no maximum rate of return on the present book value of railroad investment can at the same time protect the shippers and consumers from excessive rates and promote greater efficiency of railroad operations. If the return level is established at a higher level than the carriers need for adequate flow of funds, it will promote the filing of rates that will support the least efficient carriers. If it takes into account the excessive investment, but freezes the return at a low level, it will only hasten the withdrawal of capital from the railroad industry. A rate of return standard for the railroads must be more flexible than the typical utility standard.
>
> We have assumed that any rate of return standard must be consistent with the making rates by groups of railroads. To the extent rates are made by an individual carrier, other standards may apply. We, therefore, suggest a new role that will provide both a regulatory guide in general increase cases and yet will promote efficiency and the influx of new capital into the industry.
>
> We think these goals can be attained, if the Commission will, (1) adopt regional rate of return that will serve as the upper limits on railroad profits in general increase proceedings, and (2) allow the regional and individual carriers to attain higher returns through reductions and consolidations of plant, and (3) allow rate increases to cover cost increases. No maxima should be established on returns attained without rate increases; nor should the new standards apply in commodity increase proceedings where individual costs and new capital are often considered."

SPC then goes on to review some of the pertinent legal standards set forth by the Supreme Court, including the so-called comparable risk test set forth in ***Bluefield Water Works & Improvement Co.*** v. ***Public Service Comm.***, 262 U.S. 679, 692-93 (1923). Earnings of utilities are supposed to approach those industries of comparable risk under this test. SPC apparently believes that this Commission improperly applied the comparable earnings test in characterizing a 4-percent rate of return as "substandard and inadequate" in, for example, Ex Parte Nos. 265/267, ***Increased Freight Rates, 1970 and 1971, supra,*** because it did not explicitly consider the impact of an allegedly overvalued rate base in comparing rail rates of return with those of other industries. SPC apparently believes that the so-called end result test of ***Federal Power Commission*** v. ***Hope Natural Gas Co.***, 320 U.S. 591, 603 (1944), requires only that operating expenses and capital costs be met. A weighing and balancing of consumer and investor interests is also required. ***Permian Basin Area Rate Cases,*** 390 U.S. 747, 791-92 (1968).

SPC then proceeds to what he believes are the relevant rate of return criteria to cope with the existing less-than-ideal rate base, pending some kind of used and useful study to reduce the presently unquantifiable overvaluation of rate base that he claims to have found.

Roadway return.—SPC concludes, since there has been no material amount of rail general mortgage financing in the past decade and no general equity financing, that the long-term return on imbedded investment in roadway properties can be found through a historical study of returns assumed by several railroads for long-term leases of road property. SPC says that the 10-percent rate of return sought by the railroads in this proceeding is "unattainable," in his opinion, and that, if adopted by the Commission, would "cede the timing and control over rate increases to the carriers." SPC argues that the use of such a figure gives no weight to the "economic overstatement" of rate base " and merely assumes that existing investment will in fact be replaced through attraction of new capital."

SPC believes that a respectable argument can be made that *no* return should be allowed on road properties since they are subject to betterment accounting "and are paid for by the shippers on a current basis." SPC argues that the external capital markets have been "effectively closed" to roadway improvements. Thus, he believes that funds for roadway replacements and improvements "must largely come from internally generated funds." Thus, SPC states, "no capital attraction rate of return is needed for roadway investment." SPC apparently assumes internally generated funds are cost free. This contrasts with his suggestion to allow an imputed interest on equity capital tied up in construction funds in a suggested revision of account 76, Interest During Construction.

Nevertheless, SPC goes on to say that, in his opinion, some return on roadway is constitutionally required, and should also be allowed for "balanced cash flow." He finds that net operating income and depreciation of road properties do not provide all the cash throwoff needed for road investment. SPC says that any rate of return on this sunk investment should in his opinion reflect "substantial overvaluation" of the book value rate base. SPC would allow higher earned returns to carriers reducing their overvalued book value rate base or generating "higher earnings through greater efficiency of operations."

The SPC reviews the rates of return on roadway leases for all three districts. He finds that about 20 percent of the net book value of property in the East is leased roadway. SPC finds that a return of 2.52 percent has been agreed upon by the railroads and their roadway lessors. Comparable figures for the West are 4 percent of the base is leased at less than a 2-percent return; and for the South, small part of the rate base is leased at somewhat over a 4-percent return. SPC finds that 2.52 percent would be an appropriate allowable roadway return for the industry as a whole under two tests he devises. The first test purports to show that the return is reasonable if the rate base were reduced to a minimum value, i.e., salvage or liquidation value. The second SPC test is the purported adequacy of cash flow, considered below. SPC seems to believe that new capital need not be attracted to roadway in view of existing excess capacity.

Equipment return.—SPC would include the cost of new equipment obligations as an appropriate part of an allowable overall rate of return in addition to the 2.52-percent return on roadway. SPC finds that a private capital market still exists for equipment financing and feels that a capital attraction rate of return is necessary for the *entire* equipment investment. Thus, SPC would ignore the actual lower imbedded equipment rate of return and would permit a higher allowable return on *all* equipment in order to attract capital for new equipment, primarily rolling stock—cars and locomotives—sufficient to replace the entire fleet. SPC believes that such a rate of return would give the carriers an incentive to replace and add to the fleet of freight cars and would provide a return sufficient to encourage use of internal funds to make the necessary downpayments for equipment trust financing.

Overall rate of return.—Combining the returns for roadway and equipment capital, SPC arrives at a maximum allowable 4.83 percent overall rate of return nationally for 1972. The following tables show that 1972 computations separately for each of the three districts and a comparison of the rate earned with the suggested allowable rate.

Computation of overall maximum rates of return allowable in rate increase cases by district, 1972 class I line haul railroads

	Amount	Average rate of return
	(000's)	*Percent*
Eastern district road:		
Owned	$5,968,083	
Used but not owned	2,256,873	
Total	8,224,956	2.52
Equipment:		
Owned	5,325,393	
Used but not owned	63,768	
Total	5,389,161	6.91
Overall	13,614,117	4.26
Southern district road:		
Owned	2,748,297	
Used but not owned	249,499	
Total	2,997,796	2.52
Equipment:		
Owned	3,200,400	
Used but not owned	392	
Total	3,200,792	6.99
Overall	6,198,588	4.83
Western district road:		
Owned	8,096,772	
Used but not owned	583,170	
Total	8,679,942	2.52
Equipment:		
Owned	7,817,722	
Used but not owned	72,083	
Total	7,889,805	7.10
Overall	16,569,747	4.70

Computation of overall maximum rates of return allowable in rate increase cases by district, 1972 class I line haul railroads—Continued

District	1972 rates of return	
	Allowable	Earned
	Percent	*Percent*
East	4.26	0.38
South	4.83	5.49
West	4.70	4.40

For 1972 the, SPC would allow no increases "merely to increase the profit element in the southern district." He characterized the western return as "still deficient" and the eastern return as "woefully deficient." He recommends that these allowable rate of return "guides" be used only for future rate increase proceedings and that these return "guides" should not be used to "reduce rates or carrier earnings retroactively." The returns would be used only as "guides" to maximum profitability for future general rate cases and for the development of return elements in cost studies in individual rate proceedings.

SPC acknowledges that maximum allowable rates of return established by regulatory authorities are no guarantee that such returns will be earned, and that business declines or competition may prevent earning allowable returns. However, SPC suggests that as the South, for example, begins to approach his suggested rate of return "guides," then it is time for the Commission to begin to deny regionwide general increases in order to "promote further efficiencies" among the different southern carriers. He would, nevertheless, still allow "individual rate relief" and "rate relief to offset rising costs of operation."

SPC CONTENDS THAT MAXIMUM RATES OF RETURN OF 4.26 TO 4.83 PERCENT WILL FULFILL THE RAILROADS' FUNDS FLOW NEEDS

SPC proceeded to test his computed rates of return against actual funds flow for the 1971-73 period. SPC disagrees with the concept of funds flow as proposed by DOT and General Mills, et al., because he believes that it is not an "independent standard for maximum earnings." He asserts that a funds flow concept merely describes earnings whose adequacy has been decided on other bases. He further asserts that even if a satisfactory funds flow analysis were "contrived," that the result would be an "unwarranted interference with railroad management." SPC assumes that such an analysis presupposes a decision by the Commission on the required mix of funds (debt *v.* equity *v.* leasing) needed as well as the maximum level of funds required. He contends that the DOT proposal would "extend the work of the Commission beyond its proper limits."

Nevertheless, in considering funds flow, SPC points out his belief that the Commission erred in allegedly failing to include external as well as internal sources of cash in a 1963-72 cash flow statement in Ex Parte No. 295, *Increased Freight Rates and Charges, 1973,* 344 I.C.C 589 at 724 (1973), appendix E, table 1, note 1, also cited in the *January report,* 345 I.C.C. 67 (1974). He notes again that external funds are generally available for equipment. His contention is that the carriers are not limited solely to internal generation of funds for meeting cash and/or capital needs. For the 1971-1973 period, for example, the carriers raised $1.87 billion through the sale of equipment obligations.

in testing his suggested allowable rate of return "guides," the SPC found that an adequate funds flow would have been provided for the period 1971 to 1973 had the suggested "guides" been in effect, and been in fact *earned* by the carriers.

SPC contends that it is "premature" to attempt to overcome deferred maintenance or to improve properties that "may not be needed in the public service." SPC points out two entire railroads that he apparently would not reproduce, the Rock Island and the Chicago and North Western. SPC argues that the various industry projections of capital requirements, ASTROS I and II and those supplied by the railroads to DOT, are sufficiently unreliable and unverifiable that they should not be supported by the rate structure but that Government assistance is needed. He notes the failure of his own efforts to secure "verifiable" capital projections from the carriers. He implies that the rate structure cannot and should not be asked to support an improved or rehabilitated level of railroad service.

SPC RECOMMENDS NEW MANAGERIAL AND REGULATORY POLICIES TO ARREST AND REVERSE THE DECLINE OF THE RAILROADS

SPC encourages the Commission to adopt new regulatory policies for the railroads that will result in greater economies and efficiency, and to promote a rationalization of railroad plant. Returning to the theme of overcapacity, the SPC recommends a reduction of trackage and the closing of unneeded circuitous routes. In his view, overcapacity "subverts the national interest in conserving energy and promoting sound fiscal management." He cites the Civil Aeronautics Board experience in increasing airline profits through capacity-reduction agreements as evidence of what can be done to promote financial stability for the railroads. He recommends that the policy of requiring all previously open rail gateways be kept open through the Commission's standard routing conditions to rail merger approvals be reconsidered. See, for example, *Pennsylvania R. Co.—Merger—New York Central R. Co.*, 327 I.C.C. 475, 564-5 (1966). Considering the Nation's rail system as a whole, SPC suggests that "truly a substantial amount of duplication and excess plant can be discovered and corrected."

Specifically, SPC urges that before permitting further rate increases based on capital expenditures, the Commission should require the carriers to present plans and programs on a regional basis for new trackage rights agreements, joint operation of facilities, and an overall reduction of excess capacity. In considering interline rates in general freight rate increase cases, the Commission is urged to decide which of the carriers need additional revenue based on the SPC's comparative rate of return "guides" and to adjust divisions, if necessary, according to a suggested formula. The formula would require the benefits of any interline rate increases to go to the less-financially-favored carrier if a more-favored carrier does not jointly agree to take the interline increase. In other words, one carrier could veto the interline increase under the proposed formula only on pain of seeing the divisions shifted to a less-favored carrier to the extent of the full interline increase. Thus an incentive would exist to jointly take the increase on the previously existing divisional bases. SPC would apparently require disclosure and publication of divisions in order to carry out this recommendation.

Additional specific SPC recommendations include greater emphasis be given to economy and efficiency in rail operations to cut down circuity in section 15(3) rail route cancellation cases. He also suggests that the Commission review long-haul trucking patterns to see if they are "consistent with the needs of the shippers and communities, environmental concerns, and public interest in economic and efficient transportation by all modes subject to the Interstate Commerce Act." He seems to suggest that comparative fuel usage should be a paramount concern. He shows that comparative average hauls for a number of motor carriers are higher than for a number of railroads as set forth in the table below:

Comparative average hauls—1972 motor common carrier and railroad

	Average haul in miles
Motor carrier:	
Consolidated Freightways, Inc	1,146.6
Yellow Freight System, Inc	1,035
Roadway Express, Inc	870
McLean Trucking Company	599
Associated Transport, Inc	509
Gateway Transportation Co., Inc	445.5
Railroad:	
Union Pacific	661
Atchison, Topeka & Santa Fe	624
Southern Pacific Company	568
Western Pacific	478
Burlington Northern	476
Chicago, Rock Island & Pacific	432
Chicago, M., St. P. & P	416
Soo Line	398
St. Louis, San Francisco	368
Missouri Pacific	350
Erie-Lackawanna R. Co	349
Norfolk & Western Ry	326

Moody's Transportation Manual, 1973.

The above table illustrates that there are motor carriers with much broader national service areas such as Consolidated, Yellow, and Roadway, than is the case for the somewhat regionally limited railroads.

APPENDIX B

TABLE OF CONTENTS

Replies to the Special Projects Counsel's submission

Page

National Industrial Traffic League 1627
U.S. Department of Transportation 1628
General Mills 1630
Railroads 1633
  Burton N. Behling 1633
  J. Rhoads Foster 1637
  William R. Martin 1640
  William F. Betts 1647
  Frank H. Coyne 1647
  John H. Williams 1652
  Richard F. Kauders 1654
  Thomas H. Kerwin 1655

APPENDIX B

Replies to the Special Projects Counsel's submission shippers and others

National Industrial Traffic League.—NITL presented its verified statement through William C. Taff, Director of Economics. NITL is dedicated to the protection of shippers' interests in traffic and transportation problems. Its position is that the present input into railroad net investment base does not constitute an appropriate base for determining a rate of return for the railroad industry. NITL indicates that it is in "substantial agreement" with the Special Projects Counsel's proposed treatment of net investment rate base. NITL indicates that its only major area of disagreement with the SPC is in setting regional rate of return guides for fair railroad earnings.

In considering the rate base, NITL indicates that it is in "basic agreement" with the Special Projects Counsel's recommended changes in existing net investment base figures. In particular, NITL would not oppose separate treatment for railway tax accruals, as indicated by the Special Projects Counsel. It also endorses the SPC's proposed treatment of accounts 80 and 76. NITL takes the position that any transfers of railroad property between railroads should be restated at acquisition cost in the acquiring carrier's rate base. NITL also agrees with the SPC that the "needed" working capital formula is a more meaningful measure of working capital than actual working capital. NITL does not object to the SPC's suggested modification of account 76 to include a return on equity capital tied up in construction projects. However, NITL feels that any return on such funds should not exceed the cost of debt.

NITL expresses some concern on the completeness of the recognition given by the SPC to accrued depreciation and for any increases in value of both depreciable and nondepreciable railroad properties when retired from a used and useful status. NITL disagrees with the Special Projects Counsel's conclusion that the *Democratic Central Committee* case does not apply to the railroad industry. NITL suggests that much carrier property would have a market value in excess of book value. In support of its position, NITL cites as an example the proposal of Penn Central to sell two inactive rail yards at a substantial sum of money presumably in excess of book value. NITL contends that in any removal of rail carrier property from rail to nonrail status that the ratepayers are entitled to the benefits of increased value resulting solely from the interaction of market forces while the property was dedicated to public service, citing *Democratic Central Committee, supra.* NITL contends that the SPC's recommendation does not adequately recognize ratepayer rights in this respect.

NITL differs greatly with the SPC's position that regional rates of return as guides for maximum general rate increases are appropriate. It claims that any increased importance of rate of return "would appear to preempt other facts which may be urged by parties" in general revenue proceedings. NITL states that it has every reason to believe that "such regional rate of returns would become, in effect, *prima facie* proof of a revenue need." NITL states its basic position as follows:

> The League would accept the position that rate of return is one of several important financial indices which must be analyzed to determine whether the industry is in need of additional funds. However, it should not be the sole determinant since analysis of funds flow, the working capital position and certain other financial data should also be reviewed. A fixed regional rate of return should not be foremost especially in view of the present inflated net investment rate base. The failure of a region to reach

> allowable rate of return for any reason, including inefficiency, should not form the basis for granting a rate increase.
>
> Furthermore, NITL is of the opinion "that the significant amount of interchange as between territories would preclude the setting of different regional rates of return."

U.S. Department of Transportation.—DOT disagrees with most of the conclusions reached by the SPC. DOT reiterates its view that "effective rate regulation should result in an inflow of funds to the railroads sufficient to cover the costs of the efficient production of transportation services." DOT goes on to say:

> The aggregate rate level should not, however, be so high as to encourage the inefficient allocation of resources nor so low as to degrade the quality of service. The inflow of funds should be adequate to cover a reasonable return on investment, as well as to provide for legitimate future transportation requirements.

DOT advocates a projected funds flow analysis and a productivity analysis as what it calls appropriate tools for rate regulation. It refers to its December 1972 statement for more details on its proposed funds flow/productivity analysis. In DOT's opinion, the record in this proceeding, "no matter how complete, is unlikely to provide justification for a particular return level," noting that reasonable returns differ from one set of economic circumstances to another. As DOT understands the proceeding, the objective of Ex Parte No. 271 is to "establish how to determine a reasonable [return] level once the valid base is determined."

DOT characterizes the SPC's statement as a "diligent and conscientious effort" to investigate the validity of the current method of determining the rate base. Nevertheless, DOT apparently has a great deal of trouble with the SPC's conclusion that the rate base is overvalued in some unspecified degree. DOT appears to have even more trouble with the SPC's attempt to construct rates of return adjusted for the SPC's allegedly overvalued rate base. DOT contends that such analysis can lead to "only an arbitrary result." Considering the SPC's eastern rate of return of 4.26 percent, DOT notes the actual rate of return of 0.38 percent and comments generally as follows:

> While recognizing that many of the railroad industry's problems flow from the fact that it is more difficult to obtain funds for roadway than for equipment, we are not convinced that simply adopting a policy of increasing their return on *existing* equity by, in effect, guaranteeing net railway operating income will by itself stimulate the acquisition of funds needed for roadway either through the sale of new debt issues or through reinvestment.

DOT claims that a rate of return/rate base analysis fails to fully consider the need to make the use of existing railroad plant more efficient. It believes that the adoption of a specified rate of return would do nothing to encourage more productive use of existing plant, and would in its view, not provide an appropriate incentive to management to be more efficient.

DOT indicates that it "is not, at this point, prepared to conclude that the rate base is overvalued and, if so, by how much." It does not accept the SPC's "leap" from a discussion of the allegedly overvalued rate base to the alleged need for new "managerial and regulatory policies." It notes that the Commission in this proceeding is concerned with the regulation of the railroad industry and not with its "remodeling." DOT indicates that the SPC's problems with rate base/rate of return analysis indicate to it that a funds flow/productivity analysis is the proper regulatory tool for the Commission to adopt. DOT also contends that ratemaking decisions are the "primary province of management," implying that the Commission's role should be minimized.

DOT expresses concern over the SPC's proposed divisions formula, claiming that it will stimulate artifically high rates, particularly for individual carriers whose revenue needs circumstances may not justify such increases. DOT opposes the SPC's suggestion that the Commission review the national need for long-haul trucking operations in a separate rulemaking proceeding. DOT suggests that any such change be "accomplished by allowing the railroad industry to exercise any marginal-cost advantage it may have, rather than by establishing automatic traffic diversion rules."

DOT believes that the SPC views the DOT funds flow proposal "too narrowly." It continues to believe that funds flow would "enable the Commission's regulatory powers to be directed toward an efficiency-oriented standard for maximum earnings." It contends that such an analysis, together with productivity analysis, "will enable the Commission to set rate levels based on economically justified costs." DOT contends that a funds flow analysis would contribute to the achievement of "efficient, economical, and stable service" and that this would serve the interest of consumers as well as of investors, particularly since DOT contends that it is the consumers "who bear the cost burden of the service which is uneconomic." DOT responds to the SPC's charge that funds flow analysis would result in "an unwarranted interference" with railroad management by saying that it agrees with the SPC that the "appropriate maximum level of funds, as well as the appropriate mix of funds, needed by each carrier should be determined by management," but that its funds flow proposal "would simply permit the Commission to examine rigorously the methodology and figures behind such management decisions," and that this is "clearly *** within the Commission's proper regulatory role."

DOT takes issue with the SPC's conclusion that he was "not convinced that large-scale programs [for deferred maintenance and delayed capital improvement] can be supported by the rate structure without Governmental assistance." DOT "does not believe that enough is yet known about this matter to arrive at this conclusion." DOT's view is:

> If users of transportation service will not accept a rate structure which will cover the costs of providing the plant for producing the service, this, it seems to us, is a clear indication that the service itself should be examined.

DOT goes on to state its belief that the SPC should prepare an analysis showing which railroad service should be federally assisted, what portion of such service is now supported by user costs and whether a given service is so vital that it should be retained through the use of Federal funds if user charges cannot support the plant necessary to produce the service. DOT makes the following additional comment:

> We are inclined to believe that the general public should not pay for capital plant which user demand cannot itself support, particularly if there is, as many believe, a duplication of facilities which would provide ample opportunities for alternative service. We hope, if the SPC intends to pursue this proposal, that he offer financial and demand analysis to support his recommendation. Beyond this, it remains our belief that there is a need for greater pricing flexibility to determine which services can exist in the market place.

In conclusion, DOT reiterates its belief that this proceeding neither can nor ought to result in determination of specific rates of return or valuations of rate base. It questions whether Federal assistance should be given to those areas of railroad service which cannot be supported by the rate structure. DOT expresses the hope that the SPC's compilation of figures, studies, and analysis will not be viewed solely as support for some of the SPC's initial conclusions and recommendations but rather that such material merely will provide the basis for "further examination, comment and recommendation by all parties to this proceeding."

General Mills.—As a general observation, GMI says that the thrust of the SPC's submission appears to be to "recommend that the Commission consider the regulation of the railroads' rate level and earnings separate and apart from any concern that the Commission may have for the larger economic problems of railroad industry." GMI states, as does the SPC, that the railroad industry as a whole is a declining one and that "substantial portions of it are in serious and indeed desperate straits." However, GMI is critical of the SPC's submission because it dwells at length upon the need to recognize and "re-order the railroads' and the Commission's accounting and reporting systems." GMI indicates that it, too, is interested in changes to the Commission's accounting procedures "where these procedures may substantially inhibit the flow of capital funds" into the industry. However, GMI argues that too much attention to this area will detract from the central matters at issue. It is concerned that this proceeding will become mired in accounting trivia. While GMI indicates that it has no objection to some form of rate base/rate of return analysis as applied to railroads, it indicates that "these concepts are, at best, simplistic bench marks against which other economic and financial factors can be evaluated." GMI's fundamental position is that the Commission should "substantially alter its regulatory focus from traditional rate of return on 'fair value' considerations to a systematic appraisal of the needs of the railroads for new inputs of capital funds to make needed capital improvements and the development of policies to arrest the present outflow of capital funds." The GMI approach is similar to that favored by DOT, i.e., cash flow or funds flow analysis.

GMI is critical of the SPC's recommendations as being "ambiguous" and "inconsistent." Particularly, GMI notes that the SPC claims that the funds flow approach would be "an unwarranted interference with railroad management," while at the same time the SPC uses a funds flow approach to test the SPC's own suggested fair rate of return "guides." GMI claims that "the SPC appears to be groping for a similar regulatory solution to a complex problem and in making this attempt is frustrated by the hard economic realities of the situation."

Considering the various specific SPC recommendations, GMI notes that it has no objection to a net investment rate base being established for railroads "only because this method of calculating value is a better, if imperfect, method of value than other methods that have been suggested in this proceeding." However, GMI urges the Commission to consider this factor as only one of several in considering appropriate earnings levels for the railroad industry. Also, GMI has no objection to the continued use of net railway operating income as a figure to be used in calculating the rate of return on net investment. It stresses, however, that only above-the-line income from railroad operations should be considered in calculating railroad rates of return. GMI indicates that this is consistent with its prior views on the appropriate role of earnings from nonrailroad subsidiaries and "the possible benefits of diversification to the industry."

GMI, however, does not agree with the SPC's recommendation that the so-called "flow-through" method of accounting for income taxes continue to be used by the

Commission. GMI favors the deferred tax method of accounting for income taxes which was approved by the Commission for financial reporting purposes only, in No. 34178 (Sub-No. 2), *Accounting for Income Taxes—Interperiod Tax Allocation (Deferred Taxes)* (not printed), decided August 9, 1974. GMI favors the deferred tax method because it contends that flow-through serves to "deprive those railroads in a tax-paying position of some of the benefits which Congress appears to have intended as a stimulus to investment in the economy as a whole."

GMI agrees in general with the SPC's assumption that the railroad rate base is greatly overvalued. GMI agrees that many railroad assets are in fact unproductive and lack earning power. Nevertheless, GMI accuses the SPC of asking the Commission and parties to this proceeding to "take on faith" that the railroad rate base is overstated in the amount of "billions of dollars." GMI claims that the SPC's "simplistic shorthand solution" of "manipulating rate of return" does no more than "re-identify a well-recognized dilemma without resolving it in a useful way." It notes that a detailed valuation may involve increasing the value of some railroad properties as well as reducing some values. However, the SPC has in GMI's view "elected to force a pro forma revaluation of the railroads' property through the medium of manipulating the rate base/rate-of-return equation," rather than through a detailed valuation study. GMI contends that the SPC's solution "emphasizes treating the symptoms rather than the condition—lack of adequate earnings." GMI states:

> The SPC obviously fails to see that the rate base has become overvalued *because of the reduced capability of railroad property to produce earnings.* If higher rates were permitted the rate base might be less overvalued. The SPC thus is trapped in the familiar circular reasoning which has harassed generations of public utility lawyers and economists. The economic fact of life is that it is a waste of time to calculate a rate base apart from a property's earnings capability. [Footnote omitted.]

GMI is critical of the SPC's view that "traditional measures of fair return" would yield excessively high returns on the presumably overvalued rate base. GMI characterizes the SPC's view as follows:

> Thus, confronted with a rate base whose value is overstated by some *unknown* amount because recorded book values have been depressed by some *unknown* amount, the SPC seeks to make adjustments for this factor by manipulating the rate of return. Put differently, the SPC has simply reduced the 10% rate of return advocated by the railroads by an amount sufficient to compensate for a perceived *but unknown* amount of excess value in the rate base. While, arguably, such an approach might have limited value for some purposes, the SPC's manipulation of the rate of return factor to adjust for an obsolete rate base serves little real useful purpose for the determination of railroad earnings. As GMI has pointed out in its prior submissions in this proceeding, rate of return can have a useful meaning only as an indicator of the *cost* of new capital for the future needs of the industry *** Earnings must be high enough to cover those costs; relationship to book value of the rate base is only incidental.

GMI is critical of the SPC's apparent view that "any increases in earnings which are not associated with general rate increases should not be subject to regulatory restraint, and that general rate increases should hinge on cost increases alone." GMI notes that the SPC does not apparently "regard return on capital as a cost, at least not a category of cost which *per se* justifies rate increases, or rate decreases." GMI is of the view that rate increases "clearly justified by direct expense increases should not be delayed by entanglement with endless questions of the appropriateness of the rate base, fair return, etc. [footnote omitted]." GMI contends that the cost of capital has become one of the "most volatile and inflated prices in the economy," and that rising prices due to increased expenses must also include the costs of capital as well as the cost of materials and wages and other operating expenses. GMI advises the Commission to:

> *** devise an approach to earnings control which is based on the total revenue requirements of the carrier, including the input prices of capital. It means that the Commission *must* consider in a comprehensive way the demands for rail transportation in the future, in conjunction with the carriers' capacity for meeting demands. Since the railroads are a capital-bound industry, their capabilities to provide increases and improved services are immediately related to earnings and consequent access to capital funds. *** Capital costs are as much a real cost of doing business as any other costs.

In considering the SPC's proposed fair rate of return guides for the three ratemaking districts, GMI notes that the SPC has in fact used a funds flow approach in testing the adequacy of funds generated for the years 1971-73 under the SPC's proposed fair rate of return guides. GMI notes the SPC's criticism of funds flow in that it is allegedly not an "independent standard" of needed revenue levels. Yet GMI observes the obvious anomaly of simultaneously criticizing funds flow as not an "independent standard," yet using funds flow to test the adequacy of certain highly arbitrary rates of return based on a presumably overvalued rate base.

GMI is severely critical of the SPC's assumption that internally generated capital requires no rate of return. GMI asserts:

> Every dollar of capital funds demands a return at least equal to its opportunity cost, regardless of whether the capital funds are labeled depreciation, earnings, or the proceeds of sales of securities in financial markets. Each dollar laid out for capital expenditures, or whatever the company outlay purposes may be, must *promise* to return more than itself or it will not be spent.

GMI also takes issue with the SPC's argument that funds flow analysis would result in "an unwarranted interference with railroad management," while at the same time the SPC appears to want to know how railroad companies plan to spend their capital funds. There appears to be another anomaly in the SPC's assertion that an analysis of funds flow is an interference with management, while proposing to require the details of planned capital expenditures is not such an interference. GMI returns to its contention that funds flow analysis is an effective way of projecting future capital needs of the railroads and that the "involved methodology of the SPC in calculating rates of return concedes as much."

In considering the SPC's assertion that "new regulatory policies" are needed, GMI indicates its support, in general terms, in principle. However, GMI does not understand the SPC's "somewhat contradictory position" in seeking policies to promote railroad efficiency, while at the same time disparaging the Commission's efforts in Ex Parte No. 305 to assure that some of the authorized general increase funds go for capital improvements. GMI agrees that the multiplicity of open routes and gateways "may create excessive and wasteful competition." However, GMI notes that such multiple open routes serve to "afford the shipping public many transportation choices that are both useful and necessary." GMI recommends that this matter be the subject of a separate proceeding similar to the so-called "gateway" proceeding, *Gateway Elimination*, 119 M.C.C. 170 (1973). GMI recommends that the divisions formula proposed by the SPC be considered in Ex Parte No. 270 (Sub-No. 3), rather than in this proceeding. GMI opposes adoption of the SPC's recommendation that the Commission take "affirmative regulatory action" to curb the growth of long-haul trucking. GMI uses both truck and rail and "desires to have a strong, healthy system composed of both."

In summary, GMI has no objection to the continued use of net investment as a rate base, and that such a base be uniform. However, GMI doubts that the SPC's rate of return analysis provides a "really useful way" of dealing with the overvaluation problem. GMI desires that the Commission use the rate base/rate of return method in conjunction with a funds flow analysis. In GMI's view, any regulatory policy changes should be considered in other proceedings and, in any event, no additional regulatory restrictions on long-haul trucking should be considered in any proceeding.

RAILROADS' REPLY TO THE SPECIAL PROJECTS COUNSEL'S SUBMISSION

In their reply, the railroads filed nine verified statements. General statements were filed by Burton N. Behling, J. Rhoads Foster, William R. Martin, and William F. Betts. Individual statements were filed by financial officers of the Burlington Northern, Southern Pacific, Union Pacific, and Southern Railway.

Burton N. Behling.—Witness Behling claims that the SPC statement will "be of little use to the Commission in dealing with rate base and rate of return" and that the SPC's statement "is a generally uncomprehending performance which fails to grasp vital aspects of, and inter-relationships between, the rate base and rate of return problems that are the central issues in this proceeding." Considering the rate base issue, Behling notes that the railroads' prior endorsement of the net investment rate base, is subject to a "most important qualification"— that a "historically oriented rate base must be associated with a rate of return which recognizes present-day realities with respect to high replacement costs and current costs of capital." Behling contends that a net investment rate base must be associated with a rate of return sufficient to attract capital in competition with returns on other capital uses in accordance with "the fundamental principle of opportunity costs." He emphasizes that a target rate of return "does not constitute a guarantee but an opportunity for the industry to strive toward." Behling accuses the SPC of going to "incredible lengths in attempting to justify a low rate of return for the railroad industry.***" Behling then says:

> If such ill-conceived counsel as this were to prevail in the Commission or subsequently in the courts (both of which seem remote possibilities), it would become necessary to develop a replacement cost type of rate base. To illustrate the vast dimensions of the problem of high replacement costs, I append to this statement *** a recent study by the AAR Staff Studies Group. Using projection methods similar to those employed earlier in a Commission's staff valuation of 1963, the current AAR study indicates that the total reproduction cost (net of depreciation) of railroad property used by Class I line-haul railroads* at the end of 1973 would be approximately $85 billion. ** Even if this order-of-magnitude estimate is overstated by as much as 5 percent, as the study suggests it may be, the figure does illustrate dramatically the tremendous problems encountered by the railroads trying to cope with the high cost of replacing their facilities. ***

*Including non-Class I properties leased by Class I lines.

** As compared with a net investment in transportation property of $25 billion, not including the book value of non-Class I lessor roads not owned by the respective lessees.

Behling argues that the high cost of replacement and the high cost of capital funds in an inflationary economy "simply cannot be ignored by looking intently backward at historical data." Behling contends that the SPC's "essentially static type of analysis" would direct the industry toward "economic decay and financial destruction." Behling claims that the "short-term interests of rate payers" overlook the "requirements for preserving a well-maintained railroad system able to compete in the markets for capital funds and to render the quality of service the Nation's commerce requires."

Behling takes strong exception to the Special Projects Counsel's assumption that there is a great deal of overvaluation in the Commission's currently used net investment rate base. It is Behling's opinion that such a "historically oriented net investment rate base is very conservatively stated, when consideration is given to the persistent decline over many years the value of the dollar and the corresponding rise in price and cost levels." Behling says that use of such a base can only be defended as a workable method if "it is joined with a rate of return which makes proper allowance for rising replacement costs of capital." Behling maintains that the physical pruning of any "excess facilities" should come first, before mandated accounting writeoffs. Behling argues that it would be inconsistent for the Commission to require lines and facilities to be kept in the public service and at the same time, to consider ordering the investment in such facilities be written down. In Behling's opinion this would be an "arbitrary destruction of investment values." He contends that any required retention of facilities in the public service is "tantamount to a finding that the properties are 'used and useful'." Nevertheless, Behling notes what he calls one of the SPC's "more constructive conclusions" that the "used and useful" rate base criterion is not feasible or practicable at this time, as a valuation basis, even though the SPC is apparently reluctant to so conclude. Behling claims that the SPC has merely substituted an artifically low rate of return for what the SPC would require as a properly valued rate base.

The SPC's claim that the railroads can be allowed to earn a 10 percent rate of return "when the railroad system attains a fully used and useful rate base" assumes a drastic reduction in present net investment base, to less than half of the present $27.2 billion base (less working capital, for 1973). Behling notes the Commission's finding in Ex Parte No. 259 that some 70 percent of the original valuations have been written off. He also notes, more importantly, that the railroads have invested some $32.7 billion in road and equipment in the period 1946 to 1973, compared with the $27.2 billion of net investment for 1973 (less working capital).

Considering various accounting matters, Behling disagrees with the SPC's suggestion that a working capital "needs" formula be substituted for actual working capital shown on the carriers' books. Seeing little difference between the two methods' results, Behling suggests that the Commission continue to use actual working capital. Behling favors the SPC's suggestion to revise account 76 to permit an imputed return on equity funds tied up in construction projects.

Behling objects to the SPC's recommendation that account 80, Other Elements of Investment, should be deleted from the net investment base without opportunity for hearing. Behling notes that the Commission has concluded that about 70 percent of the original dollar cost established in the basic valuations has been written off as a result of property retirements, thus an account 80 problem, if any, is gradually being reduced through the passage of time. Behling notes that "with no apparent concern for consistency," the SPC pursues "a dominant aim" to stand for whatever course of action will lower the rate base, i.e., recommending the continued subtraction of account 80 credits from net investment while ignoring account 80 debits, instead of netting the debits and credits as is presently the Commission practice. Behling would allow a net debit balance for 1973 of $273 million to be included in the base.

Behling agrees with SPC witness Boland that "the rate base under betterment accounting would be understated when compared to what it would be had depreciation accounting been followed in the past." Behling also claims that with the inflationary trend of recent years that the rate base would be further understated with betterment accounting as compared with depreciation accounting. In considering the treatment of deferred taxes for ratemaking purposes, Behling notes that the Commission has recently modified its financial reporting requirements to provide deferred taxes for the year 1974, and subsequent years, to state financial reports on a generally accepted accounting principles basis. Behling notes the SPC's continued support for the Commission's present flow-through treatment of taxes for ratemaking purposes, but Behling feels that such a policy is inconsistent with "the basic policy objective of Congress in permitting accelerated depreciation for tax purposes, namely to stimulate capital investment."

Commenting on the SPC's rate of return approach, Behling takes further issue with the SPC's assumption that rate of return must be adjusted downward to allow for "economic overstatement in the railroad rate base today." Additionally, Behling makes the following comment:

> The SPC statement also adopts as a premise *** which runs through its presentation that the rate structure cannot support an adequate rate of return for the railroad industry. Whether and how an adequate rate of return may be achieved is not a matter to be determined by Ex Parte 271. We have repeatedly pointed out in this proceeding that the determination of a reasonable rate of return is not to be regarded as a guarantee but an opportunity to strive toward. The extent to which adjustments in the rate level and structure may contribute to that objective in the future is uncertain. But, to repeat, that is simply not a matter properly to be foreclosed or settled in Ex Parte 271.

Behling disagrees with the SPC's conclusion that no rate of return is necessary on internally generated funds or retained earnings. He criticizes the SPC's use of long-term returns on leased road property agreed to by the eastern railroads as an element in the SPC's overall fair return guide. He indicates that such past historical rates of return do not provide a proper test for future capital attraction return requirements. He also notes than many eastern leased roadway arrangements were made between affiliated operating railroads and corporate shells "of long standing." The rate of return on leased eastern road property is, in Behling's view, thus improperly imputed to the West and South.

On the SPC's proposed rate of return element for equipment, Behling takes issue with the SPC's use of only the 1972 equipment obligation rate of return as an adequate projected return for the future. Behling is of the opinion that 7.04-percent return on 1972 equipment obligations shown by the SPC does not properly represent the current cost of capital and is "substantially too low." Behling notes that while there is a lower, imbedded cost of equipment capital than for new capital, nevertheless imbedded costs of capital will have to be replaced with new equipment capital costing several times as much as the old. In Behling's opinion historical imbedded costs can be no more than a "starting point" in a "realistic, ongoing determination of a reasonable rate of return for the railroad industry or any other regulated industry." Behling notes that the SPC appears to assume that leasing equipment is costless, or that leasing is less expensive than other means of equipment financing.

Considering the SPC's proposed 4.26-percent overall rate of return for the East, 4.83 percent for the South, and 4.70 percent for the West, Behling criticizes the SPC's comment that general rate increases should "be limited to only those needed to cover proven cost increases." Behling claims that any attempt to distinguish operating costs increases and capital cost increases is "a false and unrealistic distinction." In his view, capital cost increases are no less real than any other cost increases. Behling concludes: "There is nothing in the SPC statement which effectively challenges the position of the railroad industry in this proceeding that it should have an opportunity to strive for an overall rate of return on net investment of 10 percent." He emphasizes again the industry's desire for an "opportunity (not guarantee)" to achieve a 10 percent rate of return.

Behling notes the general problem of attracting future capital which he contends is applicable to all American industry not just the railroads. The railroad industry must compete in the free market for capital with all types of industries, some of which have higher, and others of which have lower, business and financial risks than the railroad industry. In view of the "strong demands for capital" in both the private and public sector, Behling asks what to him is the critical question:

> In such a setting of strong demands, how could the railroads compete effectively for capital funds if their prospects are to be limited by rates of return on net investment of less than 5 percent? Regulation cannot remain so far out of step.

Behling agrees with the SPC that no specific allowable rate of return should be set for each individual railroad and that such an approach would be "impracticable." However, Behling disagrees with the SPC's regional rate of return approach. Such regionalization is objectionable in Behling's view primarily because it ignores the interconnected nature of the railroads—where some 70 percent of the traffic is handled by two or more railroads. He notes, too, that many railroads cross regional district boundaries, for example, the Norfolk and Western, Illinois Central Gulf, Seaboard Coast Line, Missouri Pacific, and the St. Louis-San Francisco. The SPC himself assumes a nationwide rate of return for roadway investment, even though Behling disagrees with the SPC's method of calculating such a return.

The SPC attempted to test his proposed rate of return guides through a 1971-73 funds flow analysis. Behling notes that such an analysis "begs all questions relating to budgetary constraints and financial limitations *** upon actual levels of expenditures in the test years 1971-1973." In fact, Behling observes that the SPC does not follow his own cautionary admonition that funds flow merely assumes that "the tester has determined the appropriate maximum level of funds needed." In Behling's opinion such a historical view completely overlooks future needs and concentrates wholly on past experience. To Behling, the declining value of the dollar and its impact on railroad capital expenditures clearly indicates that the industry is "falling behind in replacement of capital facilities and that it is literally consuming its capital." The primary source of railroad productivity increases is said to be capital investment in improved technology and that if capital investment lags, so, also, does improvement in productivity. Behling indicates that the railroad industry must generate higher earnings so that the investment community will be inclined to support more and more debt for necessary capital improvements.

The individual class I railroads are organized by Behling into their corporate systems. For example, the Southern Railway system shows a net investment in transportation property of $1.47 billion and an alleged net reproduction cost of $4.02 billion. Book value for Southern is shown as $1.78 billion and market value of capitalization is shown as $1.15 billion. Considering the Nation as a whole, net investment in transportation property is alleged to be about $25 billion and net reproduction cost is alleged to be about $85.4 billion, while book value is about $27.6 billion and market value of capitalization is estimated at some $15 billion.The net reproduction cost estimate is said to be an update of the Commission staff's 1963 valuation which showed an estimated net reproduction cost of some $35 billion.

J. Rhoads Foster.—Railroad witness Foster believes that the concepts adopted by the Special Projects Counsel are "invalid and inapplicable." In Foster's view, the SPC has committed three conceptual errors: (1) That past earnings rates experienced by the regulated industry are an appropriate measure of what the industry should be allowed an opportunity to earn; (2) that a rate of return which is not sufficient to enable the railroad industry to attract capital from external sources is fair and reasonable for the industry; and (3) that the railroad industry should not be given an opportunity to earn a fair return because it has not been able to do so under past circumstances. Foster contends that the SPC has erred in considering past rates of return as a limit on future fair returns. In the Foster view, there must be a distinction between an actual and a fair return. He indicates that railroad rates for the future should be based on fair returns for the future, not limited by actual past earnings. The SPC would apparently make actual earnings a restraint on what the railroads should be allowed to earn. In Foster's view, a fair return should be equal to that which could be obtained from alternative investment opportunities of corresponding risk.

While conceding that the railroads have not been able to find external public investment capital for roadway improvements, the SPC nevertheless goes on to assume that when capital has been committed or sunk and cannot be withdrawn, that the property can be maintained by the use of funds from internal sources and that no return on such internally provided capital need be required. Foster contends that it would be unfair for reasons of both "equity and economic efficiency" for the Federal government to "retroactively *** deny to investors in regulated industries an opportunity to realize earnings equivalent to the returns available from alternative investments in unregulated enterprises of corresponding risk." Foster points out that "if investors are put on notice that they will not be treated fairly once they have committed their capital to the regulated enterprise, they will require an appropriately higher return on commitments of additional capital to compensate for the unfair treatment."

In Foster's opinion "it is consistent with proper regulatory theory and the public interest that rates should be raised to yield a return which is as close to the fair return as may be feasible subject only to competitive market restraints." Nevertheless, Foster maintains that the prospective ability of the railroads to achieve earnings equal to the alternative opportunity cost of capital is a matter properly determined in a "review of

best copy available

freight rates, not in this proceeding." Foster disagrees with the SPC that a fair rate of return of 10 percent would in any way "cede the timing and control over rate increases to the carriers," because, as he notes, the disposition of general freight rate increase applications is "under all circumstances" the responsibility of the Commission.

In considering the SPC's allegedly overvalued rate base, Foster feels that "fixing a rate of return on existing net book investment at a fraction of the cost of total capital would be arbitrary and inconsistent with generally accepted regulatory standards." Foster contends that the SPC misunderstands the prudent investment theory of rate base regulation. In Foster's opinion, prudent investment means "capital embarked in the enterprise," and that investors are entitled to "be protected from the risks of fluctuating prices and changing economic and operating circumstances insofar as the ratemaking process may apppropriately function to provide such assurance of return stability." Foster argues that if market value is to be used to reduce rate base for any low-value assets, then consideration must also be given to railroad industry assets which have appreciated in value (for example, land and rights) for consistent treatment under a market theory of valuation. He notes that the "value" of any business property is "rooted in [its] prospective earning power." On the other hand, rate base for rate regulatory purposes is today usually measured by cost not "fair" value. To use prospective earning power as a measure of rate base in utility rate regulation would be to engage in a well-known exercise in circularity.

Foster finds that the SPC has "not clearly defined its 'used and useful' concept." In Foster's opinion an item is "used and useful if it is rendering service to the public or has standby capability to render service." In his opinion, "used and useful" has little if anything to do with the value of the property of the regulated enterprise. Foster contends that if the Commission were to adopt a value approach, then consideration of appreciation as well as depreciation in the value of railroad property would be necessary. The Commission would then also have to return to the detailed "fair value" valuation analyses such as were made prior to 1944 and the *Hope* case. Such a detailed nationwide railroad asset valuation would be expensive and difficult, as the SPC recognizes. In considering the question of excess capacity, Foster is of the opinion that some unused capacity is necessary for all enterprises, regulated or unregulated. He believes that it would be improper for the railroads to write off any investment when the Commission has not authorized or permitted abandonment of service. He feels that "as long as the railroads are obligated to serve and to maintain standby capacity, denial of opportunity to earn a fair return would be arbitrary and inconsistent with generally accepted regulatory standards."

Foster disagrees with the SPC's suggested rate of return guides because "(1) historical fixed charges are not a measure of the cost of common equity, either historical or current, and (2) imbedded costs of capital rates disregard both experienced and anticipated inflation ***" Foster notes that the value of money has declined by 44 percent since 1957-1959 and by 20 percent since 1972 to the early part of 1975. Put another way, Foster believes that a rate of return on a given original cost rate base must be 20-percent higher in early 1975 than in 1972 to equal the same real income. Foster calls this an inflation premium. Foster believes that the SPC has completely ignored inflation, since he simply projects 1972 experience into the future without any inflation adjustment. Foster concludes that "When the rates of a regulated industry are held at levels which preclude a prospective earnings growth equivalent to earnings expectations from other investments of corresponding risk, investors pay lower prices for the securities of the regulated companies relative to earnings and dividends believed to be in prospect." In Foster's opinion, regulatory policy may

recognize inflation in one of two ways: (1) through the use of a so-called fair value rate base (original cost adjusted for decline in value of nominal dollars) with a rate of return measured by the current cost of capital, or (2) through the use of an original cost rate base with the rate of return adjusted upward to reach the same end result as that obtained with the use of a fair value rate based.

Foster criticizes the SPC's imputing of the eastern district's leased roadway rate of return to the Nation's entire roadway investment, as "illogical, internally inconsistent, and contrary to fundamental principles of finance theory, investor return requirements and rate regulation, and legal standards of reasonableness." Foster observes that imbedded costs of leased roadway are not a measure of either historical or current cost of capital represented by debt and equity investment in roadways. He notes that the leased roadway item represents a small fraction of the total roadway investment in the eastern district and that leased roadway is an even much smaller portion of the roadway investment in the other two districts. Foster claims that the SPC simply puts to one side the higher leased roadway rates of return for the West and South and adopts the eastern rate of return of 2.52 percent as a nationwide roadway rate of return element for his proposed overall rate of return. The eastern roadway rate of return reflects primarily the experience of the Penn Central which operates over many lessor companies, and that such low rates of return have been negotiated in many cases at something less than arms length over a long period of the Nation's history. Foster disagrees with the SPC's test for the reasonableness of his proposed roadway rate of return, i.e., whether or not such a 2.52 percent rate of return is reasonable on at least the bare minimum rate base valuation (salvage value), and whether a reasonable flow of funds results. Foster believes that for a salvage value rate base to be considered in this proceeding that the railroad industry must be *in extremis* and that the industry's liquidation must be contemplated, as for the streetcar company in the *Market Street Railway* case, 324 U.S. 548 (1945). Foster claims that the SPC's funds flow or cash flow test entirely overlooks the possibility of external roadway financing if a fair return were allowed.

In considering the SPC's proposed equipment rates of return of 6.91 percent for the eastern district, 6.99 percent for southern district, and 7.10 percent for western district, Foster argues that these returns do not represent the current cost of capital because "(1) rates on new equipment obligations are not the same as the total cost of capital, (2) the cost of debt is imputed to the cost of equity, and (3) a historical cost rate is assumed to measure the current and prospective costs of capital." Foster notes that the figures proposed by the SPC are based on equipment rates of return for the year 1972. Substantial inflation has taken place since 1972 and such historical imbedded rates of return for equipment are not reasonable for the future in Foster's opinion. Foster notes an anomaly in that the SPC's equipment rate of return for the eastern district is lower than for the other two districts, even though it is generally recognized that the eastern district has the greatest business and financial risk.

Foster notes that the same anomaly exists with the SPC's overall recommended rate of return guides for the East of 4.26 percent, for the South 4.83 percent, and 4.70 percent for the West. The greatest business risk is obviously in the East and yet the SPC's methodology would result in the lowest rate of return for the East. Foster comments as follows:

> It is a fundamental principle of finance theory that the return requirement increases with business and financial risks. Business risks are all the risks of capital loss arising from changing economic conditions, competition, political decisions, and so forth.

Financial risks arise from the introduction of leverage into the capital structure. As the amount of debt increases, the income available for the common equity decreases and is more volatile. Business risks are greatest in the Eastern District as evidenced by earnings deficiencies over many years. This risk is recognized by SPC, who states: "Our recommended return levels do not imply that such returns are achievable in all districts, particularly in the Eastern District ***."

Foster notes that debt is 48.97 percent of the net investment base in the East, 40.99 percent in the South, and 37.95 percent in the West. Foster contends that "legal standards of fairness which require opportunities to earn commensurate with risk," are violated in the SPC's proposed overall rate of return for the East. There is said to be a lack of recognition on the part of the SPC that the cost of equity investment should exceed the cost of debt by a substantial margin as a "fundamental principle of finance and rate regulation." He argues that the different debt ratios in the respective net investment bases for the three districts should be reflected in differing rates of return to be allowed on common equity. For example, he notes that the South has the highest allowed return on net investment base, however, it also given the lowest return on equity, which to him suggests that "the equity is being penalized for the use of leverage." As a concluding comment, Foster argues that the overall assets of a railroad company are "interdependent parts" and that to him it makes little sense to determine the rate of return for one kind of railroad property independent of another kind of property.

William R. Martin.—Railroad witness Martin is a senior policy analyst with the Association of American Railroads. His statement is primarily a response to the funds flow section of the SPC's statement. Martin contends that the SPC has not properly applied the "basic principles of funds-flow analysis." Martin goes on to develop projections of cash flow that allegedly "demonstrate the total inadequacy of the SPC's recommended maximum rates of return."

Martin's funds flow analysis is defined as the flow of cash through a corporation. Martin prefers this definition as the "least ambiguous" of several alternative definitions, which include changes in working capital, cash plus marketable securities, as well as cash alone. Martin notes that cash is required to buy new freight cars, pay employees, and to satisfy tax collectors and that it is the lack of cash that causes bankruptcies. Martin states that it is a "immutable natural fact" that an organization cannot dispense more cash than it has available. Cash sources are said to always equal cash uses because expenses will have been curtailed to equal cash available. From this, it follows that any analysis of the historical expenses is inadequate unless such analysis considers an independent standard of what should have been spent to provide adequate service. Martin contends that any historic cash requirements are adequate for a future analysis only if they are adjusted for known or for projected changes in conditions, "such as price inflation and growth in demand for rail transportation."

Martin is critical of the SPC's cash flow statements because the SPC has made no independent estimate of adequate expenditure levels, has allegedly not considered all sources and uses of cash, and has attempted to associate particular sources of cash with specific uses. Martin's basic disagreement with the SPC is that SPC's analysis would project past inadequate expenditures into the future, with no recognition for inflation in the prices of materials, labor, and equipment, and in the cost of attracting captial. Martin asserts that "Depreciation flows from $5,000-10,000 freight cars cannot pay for today's $28,000-40,000 freight cars. A 4% return on investment cannot cover

8-10% equipment interest rates, nor attract needed equity capital." Martin contends that if the SPC's analysis were adopted, it would result in a 0.75 percent eastern district return (and an associated return on equity of minus 2.7 percent) being reasonable, simply because no cash deficiency could be found by the SPC. Thus the use of actual past inadequate expenditures is completely inappropriate for determining future cash flow and rate of return needs, according to Martin.

Martin prepared a series of financial projections to demonstrate the future results of adopting the SPC's recommended rate of return guides. Martin concludes that "under the best of foreseeable conditions, the recommended rates of return spell financial disaster for the railroad industry." Martin was able to make these financial projections by using the so-called Financial Reports Output Generator (FROG), which is a computerized financial model that can be thought of as an "automated accounting department." Martin limited his projections to the South and West since the eastern situation is quite unpredictable in view of the reorganization process taking place. Martin's estimates are based on projections of capital needs for the years 1974-78 made by "most railroads." He expanded his estimates on a revenue ton-mile basis to include those railroads that did not provide him with capital need estimates. Martin believes that the railroads' individual projections are more conservative than other estimates made under the ASTRO program or by DOT as set forth in the table below.

TABLE 3

Annual capital investment needs
(dollars in millions)

Base year of study	ASTRO	DOT Nat'l transportation report[a]	ASTRO II	Actual	Railroads' projections
	1969	1972	1973	1973	
Freight Cars:					
Units (b)	110,000	d	98,000	40,735	(c) 62,290
Original estimate cost	$1,550	d	$1,900	$611	(c) $1,495
1974 cost	2,640	--	2,352	978	(c) 1,495
Locomotives:					
Units (b)	1,980	d	1,975	1,339	2,050
Original estimate cost	$496	d	$500	$281	$623
1974 cost	605	--	600	330	623
Other equipment:					
Betterments	e	d	e	d	125
Total equipment	$167	d	e	d	d
Original estimate	$2,213	d	$2,400	$893	$2,243
1974 cost	3 245	--	2,952	------------	2,243
Fixed plant capital improvements:					
Original estimate	d	d	475	$449	$1,105
1974 cost	------	--	560	530	1,105
Total capital needs:					
Original estimate	d	3,123	2,875	$1,342	$3,349
1974 cost	d	3,900	3,512	------	3,349

(a) 1972 National Transportation Report, Table V-23, Pp. 160.

(b) Units estimated from cost projections.

(c) Does not include estimates for private car lines, shipper owned cars, or Trailer Train cars (including Railbox).

(d) Not estimated separately.

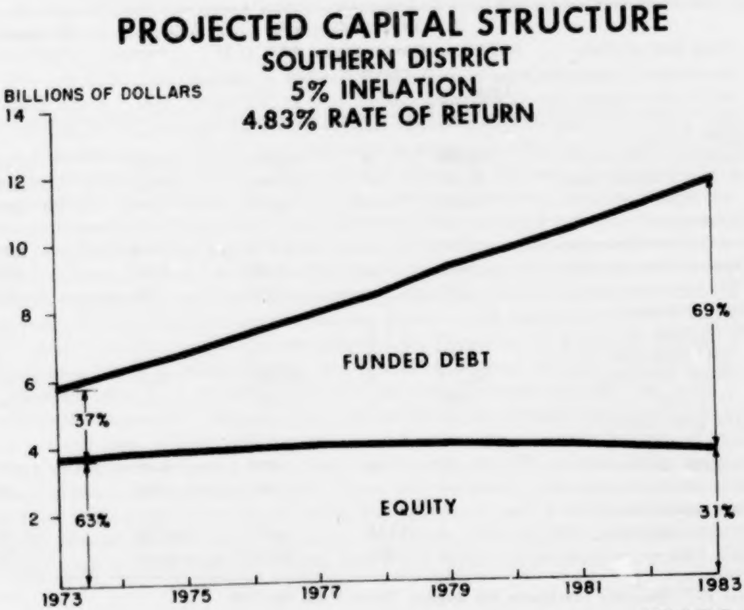
(e) Not estimated.

Martin made his projections with three inflation assumptions: a 5 percent annual inflation rate, a 10 percent inflation rate and a third set of inflation projections made by Chase Econometrics for the United States Railway Association. Expenses (other than depreciation and retirement charges) were based on 1974 estimates, assumed to increase by 3 1/2 percent per year to allow for traffic growth and further increased by an assumed inflation rate. No increment was added to make up for deferred maintenance. Operating revenues were than set based on the rate of return guides recommended by the Special Projects Counsel—4.7 percent in the West and 4.83 percent in the South.

Income taxes and dividend rates were projected at the effective rates of payment for the year 1973. Taxes other than income taxes and cash, receivables, materials and supplies, and current liabilities were all assumed to increase at the rate of inflation. The principal assumption made about financing was that an unlimited quantity of debt would be available at a constant interest rate.

Under Martin's 5-percent inflation projection, the debt ratio for southern district rises from 37 percent in 1973 to 69 percent in 1983, "a totally unacceptable level," according to Martin.

FIGURE 2



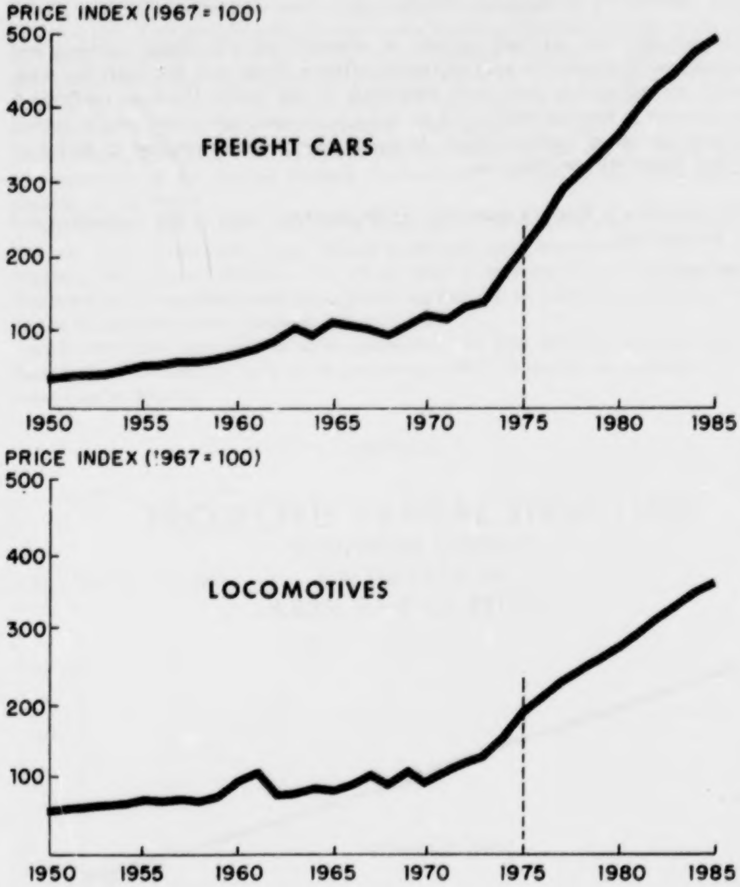
Martin concludes:

> The industry has survived periods of adversity by reinvesting earnings and depreciation. However, the unprecedented inflation of the past two years has made present internal sources even more inadequate for the future. [footnote omitted] A large increase in earnings may suffice for some companies; others will need to market additional shares of common stock. In either case, a significant rise in return on invested equity will be required.

The following is Martin's projection of the purchase price of new equipment and new locomotives:

FIGURE 4

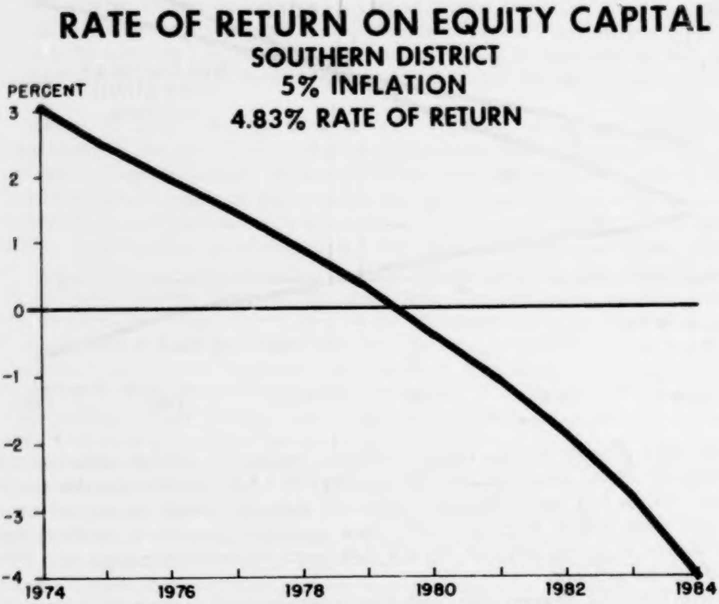
PURCHASE PRICE OF NEW EQUIPMENT



SOURCE: An Economic Model for the Railroad Industry, Chase Econometrics Associates, Inc. Dec. 1974, P. 111 & 124

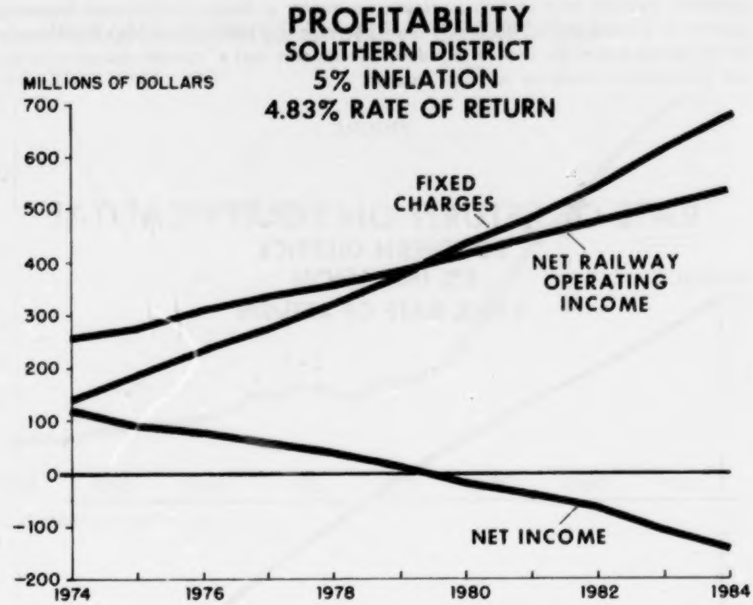
Martin's projections show that as new debt is added at interest rates above the maximum allowed rate of return, return on equity is forced to fall, and becomes negative in a short time. This is said to be the result of setting a maximum allowable rate of return below the cost of new debt. Martin says that a "clearer disincentive for new investment would be hard to imagine."

FIGURE 5



Martin claims that in any event "a maximum allowable rate of return must be set higher than the cost of new debt to avoid lowering, and eventually eliminating, railroad profitability as total investment grows." The projected effect of an allegedly inadequate rate of return on the southern district assuming 5-percent inflation is shown below:

FIGURE 7



Martin thus projects for the southern district, assuming 5 percent inflation, that profitability will be gone by about 1979 with the SPC's 4.83 percent allowable rate of return. Martin says that "responsible financial managers" would do everything to prevent these results from occurring. New investment would be curtailed and maintenance would be deferred. No new debt would be undertaken since such debt could not be serviced.

Martin indicates, however, that "cash flow projections such as these are of little use in this proceeding beyond screening out grossly inadequate proposals." Martin contends that where a rate of return will eventually provide no return to equity investors, "the inadequacy of that rate of return is incontrovertible." Martin contends that some "independent standard" is necessary to determine if a particular positive return to equity is to be projected. A projected return to equity can only be "fair and proper," Martin contends, through an analysis such as that performed by witness Foster in his December 1972 statement in this proceeding. Martin feels that the adequacy of cash flow can only be in doubt when a proposed regulatory rate of return does not allow a return high enough to attract both debt and equity capital. When it is possible to attract both forms of capital any anticipated cash flow deficiency can be met by issuance of an appropriate mix of new securities. Martin concludes:

> The SPC recommended maximum allowable rates of return, if adopted, would not allow the railroad industry to attract equity capital because the anticipated return on

that capital rapidly would fall to zero. Without sufficient prospective earnings coverage, debt capital would also be unavailable. The resultant decline in new investment would serve neither the shippers' interests nor the public interest.

Martin also claims that the past 2 years' inflation has increased the new capital requirements to the highest levels in the past 50 years. He contends that both new debt and new equity capital are required. As a final comment, Martin says:

> Adoption of the railroads' recommended maximum rate of return and the retention of the existing rate base would not guarantee the future viability of the industry, but would provide an *opportunity* for survival as private enterprise. This opportunity would be denied if the hopelessly inadequate rates of return recommended by the SPC were to be adopted. The viability of the industry would be destroyed as debt ratios reached intolerable levels, fixed charges could not be met, and equity steadily eroded.

William F. Betts.—Witness Betts is Vice President, Economics and Finance Department of the Association of American Railroads. Betts' statement is directed to the Special Projects Counsel's proposed 2.52-percent roadway property rate of return based only on the historical rate of return for leased roadway property in the eastern district. Betts contends that such a rate of return is "illogical and *** was developed without consideration of relevant facts." SPC exhibit 19 shows that leased roadway property by Penn Central amounted to about 70 percent of the total leased property for the entire eastern district. Thus, Betts feels examination of the Penn Central leasing experience must be given great weight. He argues that many of these leases are very old, some going back as far as 1849, and that such implicit rates of return are "far removed from current economic and financial conditions." In most instances, according to Betts, Penn Central plays a dual role of lessee and stockholder of the lessor company. Betts' exhibit shows a "well-defined relationship" between the extent of PC's ownership—i.e., the higher the percentage of ownership—and the lower the annual rate of return. An apparent purpose of many of these leasing agreements is to effect savings in income taxes. In any event, Betts indicates: "There is no reason to conclude that implicit interest factors in lease agreements between a parent lessee and subsidiary lessor in any way represent real economic factors which would be reflected in leases negotiated on an arms' length basis." Betts shows examples of independent lessor railroads obtaining rates of return approximating 10 to 12 percent. He feels that these are "much more reliable indicators of a fair rate of return on investment in railroad roadway property than an average ratio such as that of the Eastern District reflecting control of lessors by lessees and adjustments based primarily on tax considerations."

Frank H. Coyne.—Witness Coyne is Executive Vice President—Finance, of Burlington Northern, Inc. His statement is offered to express the point of view of a typical railroad financial officer whose responsibility is to attract capital for a railroad. Coyne deals with the SPC's roadway rate of return, equipment rate of return and the allegedly overvalued rate base.

Coyne disagrees with the SPC's proposition that a 2.52-percent roadway rate of return is adequate. Coyne argues that "sound financial management dictates that the financing decision—capital source—be kept separate and distinct from the investment decisions—capital use." Coyne maintains that a financial officer seeks to secure the necessary capital to finance each year's capital expenditure program through the best compromise between the costs of capital and its effect on financial risk, or its effect on the debt-equity ratio. Coyne urges the Commission to look to the borrowing capacity of the entire corporation, rather than the financing of specific types of equipment or roadway.

Coyne argues that the SPC's approach contradicts certain court rulings. He disagrees with the SPC's 2.52 percent roadway rate of return for many of the same reasons illustrated by witness Betts. Coyne agrees with witness Foster that a carrier return must meet the following criteria:

> (1) A return on equity capital commensurate with returns on investment in other enterprises having corresponding risks.
>
> (2) A return sufficient to attract the required additional capital, new or refunding, including capital obtained by reinvestment of earnings, as well as capital obtained by sale of new securities.
>
> (3) A return sufficient to insure confidence in the financial integrity of railroads and to maintain their credit.

It is Coyne's view that a fair return must be sufficient to attract additional capital, "including capital obtained by reinvestment of earnings." Coyne knows of no rule requiring earnings or cash flow to be reinvested in railroading without adequate compensation. He indicates that such funds are subject to the "prerogative of management" acting on behalf of a corporation's stockholders in whose name earnings may be reinvested or returned to the stockholder in the form of dividends. In any event, in Coyne's judgment, it will "be an absolute necessity for railroads to borrow funds to provide facilities and, of course, to refinance maturing debt." Coyne agrees with witness Foster's argument that investors already in the railroad business must and should be given fair treatment through a fair rate of return.

Coyne disagrees with the SPC's assertion that railroads have not been able to raise external funds for roadway investments. He submits an exhibit which lists bonds either sold or pledged as security by railroads since 1955, taken from Moody's *1974 Transportation Manual*. Of the 98 issues listed in his exhibit he asserts that 23 were placed "in part, for the purpose of making roadway improvements." He also asserts that additional roadway improvements were "in part financed indirectly from another 24 issues ostensibly placed for general or working capital purposes." He also notes that debt financing supporting imbedded capital must be refunded and that such refunding, in effect, continues to support original or existing roadway investments.

Nevertheless, Coyne concedes that the capital markets have been "restricted" as far as many particular railroads are concerned and certain others have been completely eliminated from the capital markets. Coyne claims that the next 10 years will be far different from the previous 10 years in the need to enter the capital markets to finance much greater capital expenditures. Coyne indicates that Burlington Northern expects to spend $400 million in new capital expenditures for road and equipment over the next 5 years, particularly to meet increasing demands for coal movements.

According to Coyne, then, the Special Projects Counsel's conclusion that the railroads do not need a "capital attraction rate of return" is in error. Coyne notes that in the absence of fair treatment of existing investors, regulation is without power to "compel investors to supply additional capital at a rate [of return] that they deem unattractive." This is one of the reasons that investors have by and large insisted that a direct lien on assets be obtained in exchange for securities, such as equipment trusts. This situation is said to be due to the inadequate levels of earnings in the railroad industry. Witness Coyne in his exhibit 2 shows that in 8 of the 19 years, between 1955 and 1973, railroads did not place straight debt issues. Coyne makes the following comment on the competition for capital:

> Burlington Northern and the railroad industry must compete for this limited capital against government and against companies including shippers, some of whom have a different view from railroads in this proceeding, offering earnings and financial strength superior to those presently offered by the railroad industry.

In his exhibit 3, Coyne offers a cost of capital analysis for Burlington Northern. Coyne believes that "current or incremental costs of capital" are the most relevant. Nevertheless, imbedded or historical capital cost is only .8-percent lower than incremental cost of capital. Coyne defines rate of return as the "capital attraction rate required to compensate the capital structure of a company," and cost of capital as the "net cost to a company after consideration of the tax deductibility of the interest portion of rate of return." Coyne estimates the historical fair rate of return for Burlington Northern as ranging between 11.36 percent and 11.88 percent, an 11.62 percent average. This compares with a historical cost of capital ranging between 10.21 percent and 10.73 percent, a 10.47 percent average. The cost of capital calculation will be lower because of the different treatment of debt interest cost. Coyne indicates that the cost of capital estimate is used by Burlington Northern in its capital budgeting process. He avers that Burlington Northern and the railroad industry as a whole have experienced "the unpleasant consequences" of failing to meet the cost of capital. They have found that "available discretionary capital is exhausted before many of the projects that we should do are reached." This limits the railroad's ability to "improve our public service capabilities, efficiency, and our rate of return."

Coyne expresses concern about bond ratings. He states that BN bonds are currently rated A. It is his desire to improve earnings and to maintain or improve the current A rating. Coyne offers an exhibit tending to show that when a rating drops below A, that there is a "dramatic dropoff" in financing capability. The exhibit shows that $4.1 billion was placed for those bonds with a Baa bond rating in comparison with placement of $20.9 billion for bonds with an A bond rating. There are legal restrictions on many institutional investors which prevent them from investing in long-term debt security with bond ratings below A. Coyne indicates that approximately two-thirds of the outstanding railroad bonds today carry a rating Baa or less, indicating financing difficulties for a large portion of the industry. Coyne concludes:

> It is obvious to me, that without improved earnings and the concomitant ability to maintain bond ratings and to draw upon the larger pool of [capital] funds, Burlington Northern and other railroads will have to drastically curtail planned service improving expenditures.

Other drawbacks to low bond ratings include increased interest rates charged, smaller average size of each issue, and the greatly increased flotation cost rate associated with placement.

Even though Coyne disagrees with the SPC's approach in linking sources of investment funds to uses, Coyne attempts to show that equipment rate of return is not treated correctly by the SPC. Coyne's exhibit 6 shows the cost of equipment trust offerings to be the lowest rate of any of the last 5 years in the 1 year that the SPC has selected for a target equipment rate of return, that is, 1972. The SPC has also chosen to use the coupon rate rather than the effective interest rate. The effective interest rate takes account of the costs of placement—printing, legal, and other flotation costs—and discounts and the effect of new issues on the price of existing equipment trust issues. The SPC appears to have overlooked the 20-percent downpayment requirement for most equipment trust obligations. The funds source for such downpayments is principally retained earnings, a form of equity. Coyne believes the SPC has erred in assuming that debt will finance such downpayments. To Coyne, this further illustrates the "fallacy in linking sources of capital to uses of capital" showing that "all capital expenditures are supported by the total capital structure of the company and should be accounted for as such." Coyne urges that witness Foster's cost of equity capital to the railroad industry of 14 percent be incorporated in the Special Projects Counsel's analysis.

Coyne disagrees with the Special Projects Counsel's claim that the railroad industry's net investment base is "drastically overvalued." Coyne offers exhibit 7 which purports to show that capital expenditures for additions and betterments to equipment, roadway, and structures have totaled over $29 billion since 1951. This compares favorably with 1974's average net investment of $28 billion in the industry and to him shows that the industry's rate base is of relatively recent origin. In conclusion, Coyne says that witness Foster's method is the proper one to approach fair rate of return if the railroad industry is to "remain viable." Coyne argues that the Special Projects Counsel's approach "most assuredly is the route to financial disaster."

Attached to Coyne's statement is a cost of capital analysis for Burlington Northern. This analysis shows both cost of capital and required rate of return on an historical and an incremental cost basis. The incremental cost of capital is used in capital budgeting as the weighted current cost which the return from a proposed investment must meet or exceed. The historical fair rate of return is a weighting of the imbedded cost of debt, leases, and preferred stock as well as an appropriate return on common equity. Coyne computes this fair rate of return as between 11.36 percent and 11.88 percent after taxes.

The costs of debt and preferred stock are relatively easy to calculate. They are simply the dividends or interest divided by the average outstanding long-term debt or the par value of the preferred stock, respectively. Coyne assumes that two-thirds of the outstanding lease obligations represent principal and one-third of the annual lease payments represent interest. The annual interest cost, then, is simply divided by the average annual lease principal to derive the capital cost of leasing.

The cost of common equity is estimated through both the market value (or discounted cash flow approach) and through the comparable earnings approach. Under the market value approach, the cost of equity, or return which stockholders expect over time, is equal to the current dividend yield plus some predicted rate of stock price appreciation and/or dividend growth. Since BN's dividend has declined since the Great Northern-Northern Pacific merger which produced BN, Coyne bases the longrun dividend growth rate on historical earnings per share growth of 17.4 percent as a maximum and an estimated 6.4 percent minimum rate for future inflation, concluding that dividends will ultimately exhibit an average annual growth rate of 12 percent. Adding this to the current dividend yield on BN common stock of 4.4 percent, he finds BN's cost of equity under the market value approach to be about 16.4 percent.

Coyne supplements the market value approach with a comparable earnings study designed to seek out industries which may be characterized as exhibiting risks comparable to those of the railroad industry, and whose average return on stockholders' equity should, therefore, indicate what BN is entitled to earn on its common equity. As a measure of risk, Coyne uses the so-called "weighted average betas" of the various industries he has selected. Beta is believed by Coyne to be the best single indicator of risk. It is a measure of the sensitivity of a stock's price to overall market fluctuation. For example, Burlington Northern's beta as of July 19, 1974, was 1.05. This is said to mean that on the average BN's stock goes up 1.05 percent for every 1-percent increase in the general market value, and down 1.05 percent for every 1-percent general market decline. Coyne presented the following table showing 10-year average returns on equity and weighted average betas for certain selected industries:

Industry	Ten-year average return on equity	Weighted average beta
	Percent	
20 electric utilities	11.9	0.74
7 natural gas pipelines	15.3	0.87
13 railroads	5.5	1.00
9 truckers	20.1	1.07
10 airlines	11.9	1.65

Coyne contends that the table indicates that Burlington Northern should at a minimum earn a return on equity of 15.3 percent and a maximum of 20.1 percent. Considering other measures of financial risk as well, Coyne concludes overall that BN cost of equity should be approximately 15.5 percent.

Considering the costs of all of the various forms of capital used by Burlington Northern, Coyne arrives at the following incremental costs of capital and fair rates of return; and historical costs of capital and fair rates of return:

Incremental cost of captial

Source of capital	Percent of capitalization	Incremental cost	After tax cost	Weighted after tax cost
		Percent	*Percent*	*Percent*
Debt	35.96	10.0	5.2	1.87
Leases	5.40	7.0	3.64	0.20
Preferred stock	1.14	8.3	8.3	0.09
Common and retained earnings	57.50	[1]15.5-16.4	15.5-16.4	8.91-9.43
Total 1974 incremental after tax weighted cost of capital				11.07-11.59

See footnotes at end of table.

Incremental fair rate of return

Source of capital	Percent of capitalization	Incremental cost	Weighted incremental cost
		Percent	*Percent*
Debt	35.96	10.0	3.59
Leases	5.40	7.0	0.38
Preferred stock	1.14	8.3	0.09
Common and retained earnings	57.50	[1]15.5-16.4	8.91-9.43
Total 1974 incremental fair rate of return			12.97-13.4

Historical cost of capital

Source of capital	Percent of capitalization	Historical cost	After tax cost	Weighted after tax cost
		Percent	*Percent*	*Percent*
Debt	35.96	5.6	2.90	1.04
Leases	5.40	7.0	3.64	0.20
Preferred stock	1.14	5.50	5.50	0.06
Common and retained earnings	57.50	[1]15.5-16.4	15.5-16.4	8.91-9.43
Total 1974 historical after-tax weighted cost of capital				10.21-10.73

Historical fair rate of return

Source of capital	Percent of capitalization	Historical cost	Weighted historical cost
		Percent	*Percent*
Debt	35.96	5.6	2.01
Leases	5.40	7.0	0.38
Preferred stock	1.14	5.50	0.06
Common and retained earnings	57.50	[1]15.5-16.4	8.91-9.43
Total 1974 historical fair rate of return			11.36-11.88

[1] Cost of equity-comparable earnings approach = 15.5 percent
Cost of equity-market oriented approach = 16.4 percent

Coyne contends that the incremental costs of capital and fair rates of return are appropriate for internal management purposes and that the historical data is appropriate for regulatory purposes.

John H. Williams.—Railroad witness Williams is manager of the transportation research bureau of Southern Pacific Transportation Company. Williams offers two statements, one of which purports to show the railroad industry's "real income" after the elimination of that portion of reported income which arises solely from allegedly inadequate depreciation charges for freight cars and locomotives; the second statement is to show Southern Pacific's most recent cost of capital calculation.

Williams contends that the effect of restating 1973 expenses to build up depreciation charges would have the effect of reducing 1973 net railway operating income by over 60 percent, from $854 million to $328 million, and 1973 ordinary income by 95 percent from $550 million to $24 million. Williams does not believe that the "devastating effects" of such a restatement of reported railroad earnings have been generally recognized. However, he notes that the accounting profession through the Financial Accounting Standards Board is now considering requiring this or a similar statement of income for all firms. Williams claims that such a restatement will have an adverse effect on the attractiveness of the railroad industry to suppliers of debt and equity capital. Williams advocates that the Commission needs to consider providing the railroad industry with sufficient earnings to earn a "real return" comparable to that which could be earned by investors elsewhere at similar risks, and a return sufficient to offset inflation. In Williams opinion, "failure to do so will seriously restrict the railroad industry's already limited access to the capital market in addition to stimulating the withdrawal of capital which is now dedicated to the provision of railroad service for the public benefit."

Williams notes that there are two methods for adjusting financial statements in order to eliminate the effects of inflation: (1) general purchasing power accounting, and (2) current value accounting. General purchasing power accounting adjusts a stated dollar basis by use of a measuring unit which reflects the dollar's purchasing power in terms of goods and services *in general*, for example, the gross national product implicit price deflator, the so-called GNP deflator. Current value accounting reflects the dollar's purchasing power in terms of those *specific* goods to which the adjustments for purchasing power is being made. To give a specific example, the cost of a freight car could be restated in current dollar costs by either using the GNP deflator, or it could be restated by using a cost index for a particular type of freight car. Williams uses the current value accounting method since he believes it "better reflects specific inflationary trends which have affected the railroad industry."

In conclusion, considering the reproduction costs of approximately $85 billion shown by witness Behling and the $328 million 1973 net railway operating income, Williams concludes that the "real" 1973 rate of return on railroad property is less than one-half of 1 percent. Williams alleges the remainder of the reported rate of return is solely the result of inflation. Therefore,

> *** the railroad industry generates little real return for its investors. Because capital cannot be attracted in the competitive market place or held within the industry under this condition, the Commission is urged to provide adequate allowance to offset inflation when establishing its fair rate of return on the railroad rate base.

Considering Williams' second statement, relating to Southern Pacific's cost of capital, Williams concludes that although witness Foster's methodology is somewhat different from his, Williams concludes that his calculation of 11-percent cost of capital for Southern Pacific is generally comparable to witness Foster's 10-percent cost of capital for the railroad industry as a whole. Williams calculates the current cost of debt to Southern Pacific at approximately 9 percent before taxes, or 4.4 percent after income taxes. The cost of equity capital is computed at about 15 percent after taxes, assuming a Southern Pacific capital structure of 34-percent debt and 66-percent equity. Williams stresses that imbedded returns such as these are not relevant to the future, and that no one is predicting a return to interest rates of, say, less than 5 percent. For a going concern, current and future interest rates and returns to equity must be contemplated.

Williams believes that his 15-percent cost of equity capital is understated by at least a 3-percent inflation factor. Thus, Williams would adjust the previously estimated overall 11-percent rate of return to about 13 percent to take account of inflation. He believes "this 13 percent to be the most appropriate estimate of Southern Pacific's current cost of capital, and *** [is] recommending its adoption within Southern Pacific." A similar adjustment, in Williams opinion, would also increase the railroad industry's recommended cost of capital to the 13-percent level. Williams does point out, however, that the industry as a whole has 42-percent debt in its capital structure whereas the Southern Pacific has only 34-percent debt in its capital structure. A higher debt ratio results in increased financial risk, thus, in Williams' opinion, the industry as a whole should show a higher cost of equity, as well as higher cost of debt, than for the Southern Pacific alone.

In considering any new proposed railroad investments at Southern Pacific, Williams indicates that such projects must expect to earn "an amount at least equal to the cost of capital." To do otherwise, "would be allocating to railroad operations capital which would be devoted to more productive purposes elsewhere in the economy." There are sometimes investments which must be made, which result in no net earnings or even negative earnings. An example could be a grade separation project required by public authority, or an environmental proposal to require installation of mufflers on locomotives presently in service. Sometimes investments must also be made in freight cars which allegedly do not move traffic at rates greater than variable cost. Such negative or low-return investments "simply accelerate the Company's consumption of its own assets, and impede its efforts to remain viable as a going concern while appropriating capital which should be employed elsewhere." Because of these negative- and low-return investments, Williams concludes that not all capital expenditures generating more than the 11-percent cost of capital can be authorized. Williams indicates:

> *** Southern Pacific's need for capital is always greater than the amounts which can be raised without distortion of the Company's capital structure and consequent deterioration in its credit rating. The principal cause of this deficiency is inadequate earnings from railroad operations. As a practical matter, therefore, the usual cut-off point each year for new investments is in the 20 to 24% after-tax return range, and other potential investments, even though returning more than the 11 percent cost of capital, are not made because of greater returns from investments with higher priorities.
>
> Until such time as railroad operations can generate increased amounts of capital through increased earnings, this short-fall of available capital will persist. The net effect of this short-fall, of course, is that traffic which should move by rail to best serve the Nation's interests cannot.

Richard F. Kauders.—Railroad witness Kauders is a senior analyst, transportation economics, with the Union Pacific Railroad Company. Kauders presents a cost of capital calculation for the Union Pacific with an approach similar to that of the other railroad cost of capital witnesses. He shows Union Pacific capital structure ratios of about 25 percent for long-term debt, about 5 percent for preferred stock, and some 70 percent for common stock. Kauders computes the cost of long-term debt to Union Pacific as between 6.27 percent to 8.17 percent, the preferred stock from 4.00 percent to 8.03 percent and a projected return on common stock equity of some 13.42 percent, for an overall weighted cost of capital of 11.20 percent to 11.86 percent.

Kauders shows a range for the cost of capital; 6.27 percent for long-term debt, for example, is the imbedded cost of debt. 8.17 percent, on the other hand, is the current market rate of return on long-term debt. Likewise, 4.00 percent on preferred stock is the imbedded cost, while 8.03 percent is the current market rate of return for preferred stock.

In considering the projected costs of common stock equity, Kauders made three assumptions about investor actions in a 15-year period from 1960 to 1974, resulting in estimates in the cost of common stock equity of 12.45 percent, 12.25 percent, and 15.56 percent, Kauders then took the average of these three scenarios—13.42 percent—as the figure used in his cost of capital calculations. Kauders then concludes that it costs Union Pacific 11.20 percent to support its existing investment using the historical costs of long-term debt and preferred stock, and 11.86 percent using current costs for debt and preferred stock to, in the future, raise or replace investment funds. Kauders believes:

> Any investment with a return less than this will only diminish the ability of Union Pacific to raise capital and to serve the public.
>
> Yet a grossly inadequate return is precisely what is recommended by the Special Projects Counsel in his Opening Statement. He proposes a rate of return of 4.70% for the Western District—a return considerably below Union Pacific's cost of funds. His recommended return of 4.70% is woefully inadequate.
>
> A return of 10-12% is no guarantee that Union Pacific can continue to serve the public with its traditionally well-regarded and high standard of excellence or to improve upon its record. But a return on the level proposed by the Special Projects Counsel is an invitation to insolvency and disaster.

Thomas H. Kerwin.—Witness Kerwin is Southern Railway's director of financial planning. Kerwin indicates that cost of capital is calculated on a periodic basis to provide Southern with some basis for making various capital expenditures. Cost of capital provides an "approximation of cost against which judgments can be made as to the desirability of various investment alternatives available to the railroad." Southern uses two slightly different methods of calculating cost of capital. The first weights the various capital structure components according to book value for debt and current market value for each equity issue. The second, weights all components according to book values. Results from the two different methods have not differed significantly over the years according to Kerwin.

Southern estimates current debt cost at 9 percent before taxes and 5.8 percent after taxes (with an effective tax rate of 36 percent). The costs of Southern's pure preferred stock is estimated at 8.3 percent; the cost of the convertible preferred is estimated at 11.2 percent. Using the discounted cash flow method of computing the costs of common equity, Kerwin estimates that common equity should return some 16.1 percent. This is based on an 11.1 percent annual rate of growth from 1964 to 1974 and an estimated dividend yield of 5 percent. The overall weighted cost of capital on a market value basis is estimated to be 10.67 percent and 10.27 percent on a book value basis. These are said to be "a reasonable approximation of the rate of return required on new investment in order to cover the cost of capital." Southern also requests that the SPC's divisions recommendation not be considered in this proceeding.

APPENDIX C

TABLE OF CONTENTS

1972 statements of position and verified statements

	Page
Railroads	1657
Behling	1657
Foster	1659
Federal agencies	1677
DOT (funds flow)	1677
GSA	1692
Shippers	1695
NITL	1695
General Mills' group of shippers (including Ford)	1700

1972 statements of position and verified statements

RAILROADS

In their initial statement of position, the Nation's railroads urge that net investment base continue to be used and that a rate of return in the range of 10 percent would be appropriate. The railroads contend that the current net investment base is "very conservatively stated" but that it should be supplemented by the amounts in account 80, Other Elements of Investment and account 90, Construction Work in Progress, requests which were denied for rate base purposes in Ex Parte No. 259, *Increased Freight Rates, 1968,* 332 I.C.C. 590, 604 (1968). The railroads prefer that any adjustment for inflation be made through increasing rate of return, rather than attempting to increase the rate base due to the greater "practibility and administrative feasibility" of the former.

The railroads elaborated on their initial statement of position through verified statements of Burton, Behling, and J. Rhoads Foster.

Behling.—Behling makes the following preliminary points about which he feels there can be no "reasonable" disagreement:

> As a setting for the consideration of the particular issues involved in Ex Parte No. 271 with respect to rate base and rate of return, it seems appropriate at the outset to highlight certain relevant circumstances of the railroad industry which should be kept in view and concerning which I believe there can be no reasonable disagreement. These circumstances include:
>
> 1. The railroad industry is an industry of low and inadequate earnings on any reasonable basis of evaluation and comparison with industries generally, a condition which has persisted over a long period.
>
> 2. This condition has been made worse by long-term inflationary tendencies in the economy and the correspondingly diminishing value of the dollar, more particularly as a consequence of the accelerated inflation which has occurred since 1965. The railroad industry is particularly vulnerable to these inflationary tendencies because it is a labor-intensive industry, with more than half of the revenue dollar absorbed by labor costs.
>
> 3. The railroad industry is capital-intensive and its capital facilities have a relatively long life cycle. This latter circumstance, too, makes the railroad industry notably vulnerable to inflation as facilities reach the end of their lives and must be replaced at higher costs.
>
> 4. The railroads accordingly must have continuous and large inputs of new investment funds in order to replace facilities, to improve them with advancing technology, and to cope effectively with increasing demands for their services in a dynamic economy. Without adequate earnings to help generate investment funds by retention and to serve as the necessary base for credit and the service of debt, the requisite investment funds will not be forthcoming in an enterprise economy. Inability to generate and attract such investment funds will result in limitations of service to the customers the industry aims to and is expected to serve.
>
> 5. These basic considerations deserve to be emphasized here, lest they be lost to sight or confused by excessively technical considerations and disputes that have so often, and for many years in the past, troubled rate-of-return-on-rate-base determinations and controversies, not alone in the railroad industry but in other regulated industries also. The problems confronting the railroad industry and the

> shipping community it serves will not be resolved if critics pursue every tactic which suggests itself to diminish the opportunity of the railroad industry to improve its earnings and, thus, its service.
>
> 6. There is one thing more that needs to be said at this point. It is not contended that the purpose of this proceeding in Ex Parte No. 271 is to provide the industry with some sort of guarantee of an earnings level to be established forthwith, based on a rate-of-return-on-rate-base determination. Such expectation would be futile, for beyond any such determination there would still remain all the problems of attaining such a plane of earnings. What can rightly be expected is that this proceeding by focusing attention upon the low and inadequate rate of earnings on investment, may help to provide the railroad industry with an *opportunity* to seek improvement of its earnings, unfettered by undue constraints stemming from allegations that its net investment base is overstated or that the industry's rate of return need only be nominal.

Behling then proceeds to argue that it is very difficult to deal with the "unsubstantiated suspicions" of an overstated rate base which lead to this proceeding and that the burden is on other parties to substantiate these allegations. Behling contends that those who would change net investment base to something else have a great burden in attempting to cast aside a well-accepted method of determining rate base. The governing principle is to record asset values at original cost at the time the property is first dedicated to transportation service less any applicable depreciation. Net investment also includes a working capital allowance consisting of (1) cash, and (2) materials and supplies. Given historic changes in prices and costs. Behling is of the view that net investment is "very conservatively stated." Nevertheless, the amounts recorded on the books are said not to be of "ancient vintage" since the Commission found in 1968 that 70 percent of the "original cost" dollars established to represent original costs from the Commission's basic valuations had then been written off. See Ex Parte No. 259, *Increased Freight Rates, 1968, supra.* Thus the bulk of the property on the books today is of recent vintage and is recorded in recent actual cost dollars. In the 1946-71 period, Behling estimates that the class I railroads made capital expenditures of $30.2 billion, compared with a 1971 net investment (excluding working capital) of $27.4 billion.

Behling argues that the present value of land has never been incorporated on the railroads' books, even though such amounts were included in the Commission's former statistical series, entitled Elements of Value; Behling believes that land is recorded at "actual cost, estimated in part." Accounting for reorganizations and acquisitions is handled under the Commission's accounting rules, consistent with the general rule that the investment accounts shall continue to maintain the amounts, less applicable depreciation, of actual cost at the time property is first dedicated to the public service. See, generally, Uniform System of Accounts for Railroad Companies, 49 CFR 1201. Such transactions are recorded only with the Commission's approval. Behling objects to any suggestion that mandatory writedowns of property precede physical abandonments permitted by regulatory authority. However, he does think that an individual railroad should be free to propose writedowns to the Commission prior to abandonment, if it so chooses. Behling points out that even if 20,000 additional miles were to be abandoned that a reduction of only some $800 million in net investment base would result. Some $400 million in passenger facilities were written off in 1971 when Amtrak took over intercity passenger service.

Behling contends that accrued depreciation is not understated due to the absence of depreciation reserves for road property prior to 1943. The track structure accounts are said to be conservatively stated. Behling claims that a $1 billion net investment increase would result from repricing ties alone at 1968 prices, as noted by the Commission in Ex Parte No. 259, *supra*, 606-07. Behling is concerned that an attempt to restate rail income using a capitalized earnings approach would result in circular reasoning through the use of present earnings to establish future earnings. Behling feels that "cosmetic" writedowns would impair the railroads' credit by depriving the carriers of the opportunity to recover past investments through depreciation. Behling contends that the railroads' need is to improve earnings in order to be able to finance the capital improvements necessary to improve service. Writeoffs will not fund future improvements.

Behling argues that, though small, the amounts in account 80, Other Elements of Investment, and account 90, Construction Work in Progress (or, alternatively, imputed interest on equity funds tied up in account 90 should be allowed in account 76, Interest During Construction) should be added to the net investment base "as a matter of principle," in a reversal of the Commission's conclusions in Ex Parte No. 259, *supra*. The debit balances for accounts 80 and 90, respectively at the end of 1971 were approximately $158 million and $143 million, or when combined amount to slightly more than 1 percent of the 1971 net investment base of some $28.1 billion as computed by the railroads. The impact of including accounts 80 and 90 would be to raise rate of return some 0.05 percent.

In relating rate of return to rate base, Behling contends that recognition must be given to "the massive capital needs of the railroads for maintaining and improving their service capabilities in the future ***." Conceivably, such recognition could be made by increasing the value of the existing rate base, but Behling argues that it is more practicable and administratively feasible to make the adjustment through a reasonable allowance in the rate of return. Behling contends that the $30 billion invested in the railroads during the 1946-1971 period represents a "progressive condition of capital starvation." The $30 billion in actual dollars reduces to $20 billion in 1946 dollars of purchasing power when inflation's effect is eliminated. Equipment can be externally financed through equipment obligations, but road property replacements and betterments must generally come from internal sources of funds which are limited by inadequate earnings, thus limiting the industry's ability to modernize. Behling claims, as do the several ASTRO reports, that the railroads should be spending some $3.3 billion a year for capital improvements, rather than the $1.15 billion the industry has been able to muster. Higher earnings could support greater levels of debt with greater margins of financial safety. Inflation has affected the costs of borrowing as shown by the increasing imbedded costs of debt, increasing from 3.87 percent in 1946 to 5.16 percent in 1971. Imbedded debt is gradually being replaced at the more recent higher interest rates.

Behling concludes that the railroads should have an opportunity to earn a minimum rate of return in the range of 10 percent on net investment, as more fully discussed by witness Foster below. Behling suggests that a rate-of-return maximum can be determined at a later time if that becomes necessary. Behling stresses that the recommended 10-percent range is in no sense a guarantee, but merely is a "target opportunity" for the industry to strive toward.

Foster.—Witness Foster was asked by the railroads to make a judgment on the rate of return the railroads should have an opportunity to earn. He argues that, unlike other public utilities, railroads do not have much competitive control over their markets. Foster claims that individual railroads can be considered only in the context of the entire national system. It is unavoidable, then, that some will earn more than others, with similar rate levels. Foster compared the earning experience of the railroads and other industries, and concluded that the overall return on capital employed by the railroads has been far below the rates of return available from alternative investments of corresponding risk.

The railroads have generally been unprofitable and their earnings unstable primarily due to intermodal competition, which has been prompted by public policy. A decline in transportation traffic share from 67 percent to 40 percent in ton-miles has been recorded by the railroads. The decline in market share is aggravated by the railroads' vulnerability to the business cycle. The lack of adequate earnings has lead to an inability to finance downpayments, thus leading to increased leasing of capital items, not normally a factor included in the rate base. The railroads, then, are in a spiral of declining ability to attract capital.

Foster concedes that the railroads do not have the same prospective ability to achieve earnings equal to the cost of capital for alternative opportunities. However, Foster argues that the right to have an opportunity to earn a fair rate of return is common to all regulated industries. Foster suggests that railroad rates should yield "as close to the fair return as may be feasible subject to constraints of competition and traffic considerations." Foster urges establishment of a "zone of reasonableness within which earnings of the railroad industry would be permitted to vary in response to managerial effort, competitive factors, and general economic conditions." Foster argues that railroad earnings should be sufficient to finance the necessary capital expenditures to maintain adequate railroad service. The railroads' gross capital expenditures of the 1960's averaged $1.31 billion annually, financed as follows:

	million	*percentage*
Depreciation charge	$7,278	55.6
Retained earnings	1,426	10.9
Decline in working capital	468	3.6
Increase in equipment obligations	1,750	13.4
Other sources including sale of assets	2,171	16.5
	13,093	100.0

Such capital expenses are understated to the extent that railroad property (such as shipper-owned equipment) financed by nonrail interests are not included. About 60 percent of the total capital funds were generated from retained earnings and charges for depreciation. Foster believes that, in the 1970's, the railroads will have to rely more on earnings and outside capital, than was true in the 1960's. The ASTRO report's annual capital need estimate of some $3.3 billion is cited. Depreciation currently provides only some $850 million in yearly funds, thus about 75 percent of future capital funds must come from retained earnings and outside capital.

Considering the productivity increases realized by the railroads in the 1960's, Foster contends that such increases have been "virtually offset" by increases in employee pay. Some of the apparent productivity gains are also attributed to expenditure reductions due to financial stringencies, such as in deferring maintenance programs.

The railroads' net investment base has been assumed by Foster to be computed in accordance with the applicable Commission accounting regulations,[1] since such determination is beyond his expertise. Foster asserts that all Federal and State regulatory commissions have used the return on rate base approach for the capital-intensive industries. All Federal commissions have used an original cost amortization rate base, without adjustments to rate base for inflation. Adjustments for inflation, if any, can and should be made through rate of return. Foster believes in a fair value rate base for regulatory purposes. Thus, fair value for regulatory purposes excludes elements of monopoly value, whether on the investor or on the consumer side. A fair value rate base for regulatory purposes may be original cost, trended original cost, or cost of reproduction, but not the value of the property at existing rates. Market value reflects the capitalized value of prospective income and is not a basis of value independent of the existing rates. The regulatory process has settled on evidences of past or present costs in the rate base to avoid the circularity apparent from sole reliance on a market value concept. Thus, Foster argues that the present depressed economic or market value of railroad property is not a proper rate base to use for rate regulation by this Commission. Such an approach would make the existing rate structure the determinant for future rates.

In considering the railroads' overall capital structure, Foster notes that a major purpose in planning the capital structure should be to minimize the total cost of capital, keep debt manageable, and to prepare for the eventuality of adverse business conditions. The overall railroad capital structure at the end of 1970 was 40 percent debt, 2 percent preferred stock, and 58 percent common equity. The 1960 ratios were, respectively, 36 percent, 4 percent, and 59 percent. A form of debt, equipment trusts and conditional sales agreements, have increased from 24 to 36 percent of long-term debt in the 1960-70 period. Increasing reliance on such financing methods is a reflection, in Foster's opinion, of the railroads' precarious financial condition, reflecting would-be lenders' unwillingness to extend credit except on the security of assets that can be readily moved, in the event of default, from one railroad to another. If the railroads as a whole had a sufficient credit standing, then better terms under either equipment trusts or conditional sales agreements than the present 15-year amortization of long-lived equipment would be possible. A lesser impact on cash flow would be made by more favorable credit terms, than the present reliance on relatively more expensive credit terms in the purchase of equipment.

Foster argues that the railroads' capital structure is far from optimal, being similar to American Telephone and Telegraph with 58 percent equity, but not with AT&T's lesser risk. The rails do not have as much debt as electric utilities and gas pipelines which have about 35 percent equity. Manufacturing enterprises in the competitive sector have about 74 percent equity. Foster believes that the 58-percent rail equity figure is too low in comparison to the risks of the business. Nevertheless, Foster relies on the actual rather than a possible constructed hypothetical capital structure based on something closer to the optimum, in constructing a fair rate of return for the railroads.

Foster then gives his opinion on the railroads' cost of capital, broken down into the costs of debt, preferred stock and common equity. Foster urges that the costs of debt include the prospective costs of debt financing, using imbedded historical debt costs as only a starting point. The imbedded costs of debt rose during the 1960-1970 period from 3.75 percent to 4.87 percent. Imbedded debt costs are expected to increase further because the present lower rate issues will mature and be replaced with higher rate issues, and because the new capital expenditures themselves will be at higher cost. The interest rate on Moody's grade AA railroad bonds has risen from 4.5 percent in the early 1960's to 8.5 percent in 1970 and then leveled off at about 7.75 percent in 1972. Equipment trust interest rates have increased from 4.3 percent in the early 1960's to 8.75 percent in 1970 and have come down to 7.00-7.25 percent in 1972 for the AA longest term certificates. Foster assumes that equipment trust interest rates will remain at approximately the 1972 levels, in the range of 7.0 to 7.50 percent. Unless carrier earnings improve significantly, Foster indicates that the prospective interest costs for other forms of debt would be "substantially higher if not prohibitive." Foster expects the overall imbedded costs of debt to reach 5.5 percent no later than 1975.

---

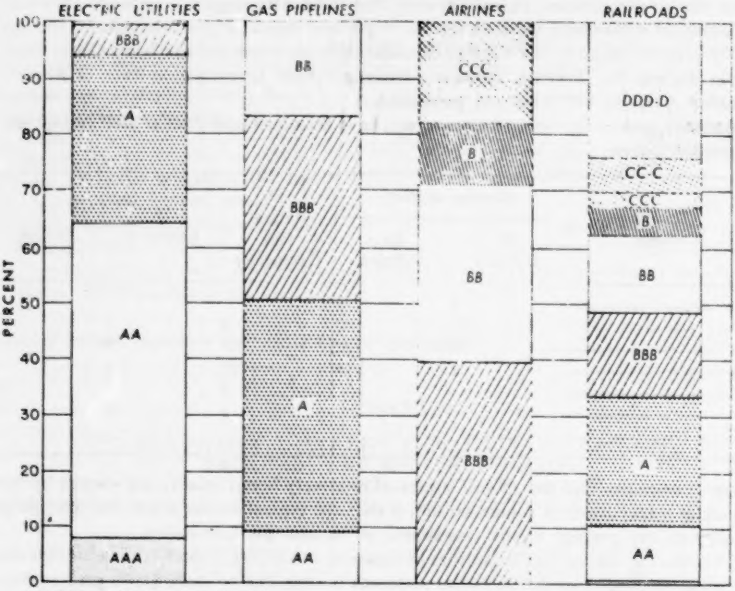
[1] 49 CFR 1201.

Foster made no separate study of the cost of preferred stock. Preferred stock is only some 2 percent of the railroads' capital structure. The computed cost of preferred stock in 1970 (dividends as a percent of per value) is 2.0 percent. This figure reflects that many preferred issues are paying no dividends; no single issue is paying only 2.0 percent. Foster believes that a proper imputed cost of capital for preferred stock should be the same as for debt capital.

Foster made a detailed study in the most complex area of a fair rate of return determination—that of the return to be allowed on equity capital. Foster sought to make a reasoned judgment on the necessary earnings requirements. Foster used two methods—the comparable earnings approach and the so-called market value method. In his opinion, neither method should be used exclusively. Foster first reviewed indicators of comparative risk. This was done through a review of security analysts' ratings and various measures of comparative earnings and stock price instability. Foster concluded from a survey of Standard and Poor's data that there is an "extraordinarily wide range of quality ratings" among railroad bonds. This is shown in chart 5, below, illustrating comparative debt ratings for electric utilities, gas pipelines, the airlines, and the railroads.

CHART 5

STANDARD AND POOR'S RATINGS OF OUTSTANDING BONDS



SOURCE: Exhibit pages 11 & 12

FA 14797

Foster believes that a review of the comparative bond ratings indicates that the "railroads do not have a favorable credit standing, have not maintained the integrity of their investment, and are not able to raise new capital on favorable terms."

Foster also reviewed common stock ratings prepared by the Value Line Investment Survey on railroads and other industry groups as follows:

	Beta Factor	Price Stability	Safety
20 electric utilities	.47	92	1.3
53 natural gas	.56	78	2.0
35 food processors	.75	65	2.4
47 petroleum	.90	57	3.0
22 railroads	.92	59	3.0
34 steel	.95	53	3.0
47 chemical companies	.97	56	2.7
72 building	1.08	47	3.0
63 machine	1.15	43	3.0
17 air transport	1.60	19	4.4

Generally, investment quality increases as beta decreases, as the price stability index declines, or as the safety factor decreases (numerically) to the point of greatest safety at 1.0. Foster concludes that railroads rank far below electric utilities, below natural gas companies, about the same as the petroleum and steel industries, and much better than that of the airlines. Foster believes that these data suggest a required return to investors of somewhere between the 12-13 percent typical of electric utilities and the 16.75 percent found by the CAB to be reasonable for trunk airlines by its Order 71-4-58 in docket No. 21866-8, Domestic-Passenger Fare Investigation-Rate of Return, decided April 9, 1971, not yet published.

Another source for rating common stocks is Standard and Poor's. S&P ratings are presented below:

Quality ratings	Electric utilities		50 Natural Gas Companies	15 Railroads	15 Airlines
	20 Utilities	99 Utilities			
A+	4	8			
A	13	42	6	2	
A-	1	33	17	3	
B+	2	16	23	4	1
B			3	5	11
B-			1	1	3
C					

Foster concludes that the 15 rail stocks of relatively better quality are viewed by the financial marketplace as somewhat better than the typical airline stock, but inferior in quality to the average equity investment in natural gas companies.

Considering the various indicators of financial instability, Foster concludes that the earnings variability of the 15 better railroads is from two to three times greater than the electric utilities, but is considerably less than for the motor carriers of freight and the airlines.

Indexes of comparative financial stability
1957—1971

	Fifteen railroads	Twenty electric utilities	Eight gas pipelines	Ten truckers	Eleven Domestic trunklines
Average of annual percent dispersion of rate of earnings on book equity from the median of the industry group.					
Mean	31	12	20	64	99
Median	28	11	20	53	68
Average percent deviation from the trend in rate of return on common stock book equity.					
Mean	23	7	10	128	292
Median	22	7	11	67	87

Indexes of comparative financial stability—Continued
1957-1971

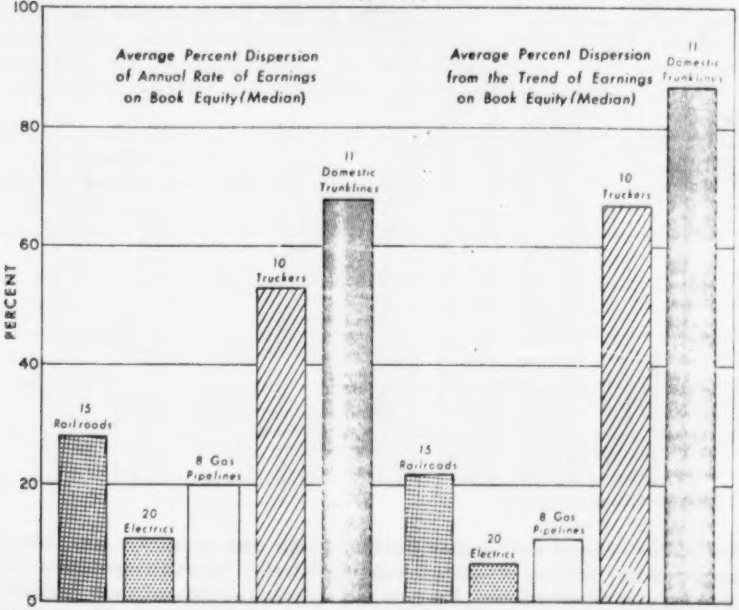
	Fifteen railroads	Twenty electric utilities	Eight gas pipelines	Ten truckers	Eleven domestic trunklines
Average percent deviation from the trend of per-share earnings					
Mean	38	7	13	158	865
Median	23	7	11	72	107
Average of annual fluctuations of market prices of the common stocks					
Mean	51	31	38	86	97
Median	47	30	38	77	86

Source: Exhibit, pages 13-15.

Chart 6 below, indicates this comparative instability.

CHART 6

COMPARATIVE INSTABILITY OF EQUITY EARNINGS
RAILROADS AND REFERENCE GROUPS
1957—1971



SOURCE: Exhibit pages 14, & 15

Foster indicates that:

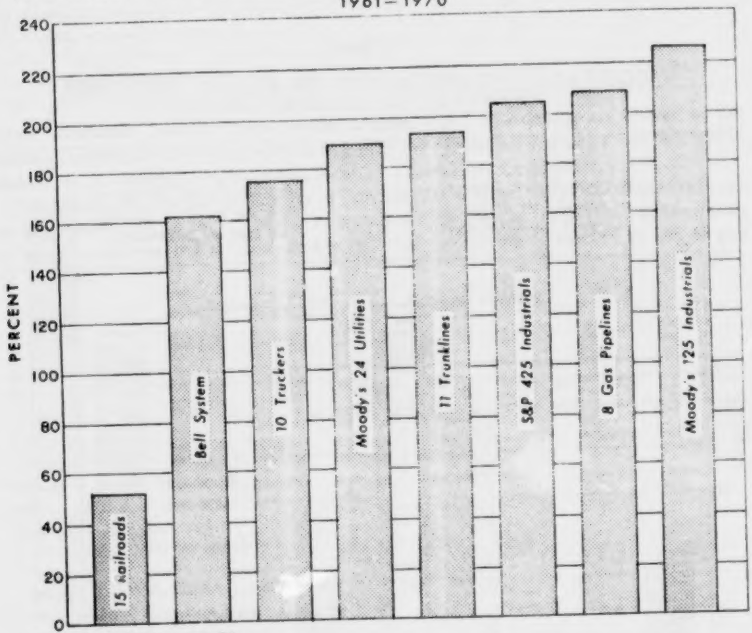
> *** it is difficult if not impossible to translate an index of earnings instability into a precise quantitative measure of differences in risk and investors' return requirement. The same is true of other indexes of market quality. Nevertheless, these tests indicate wide differences which must be recognized in earnings regulation if the railroads are to have a fair opportunity to realize a return commensurate their risk characteristics. This analysis confirms the indication that the cost of capital and fair rate of return on book equity are higher than that for electrics but below that of airlines.

Market prices of common stocks are an indicator of relative investor confidence. The ratio of market price to book equity per share is an indicator of the income producing capacity of already-committed common equity. Chart 7, below, shows average market to book ratios for the 15 railroads, for regulated industries and for industrials over the 1961-70 period.

CHART 7

AVERAGE RATIO OF COMMON STOCK PRICE TO BOOK EQUITY

1961–1970



SOURCE: Exhibit page 16

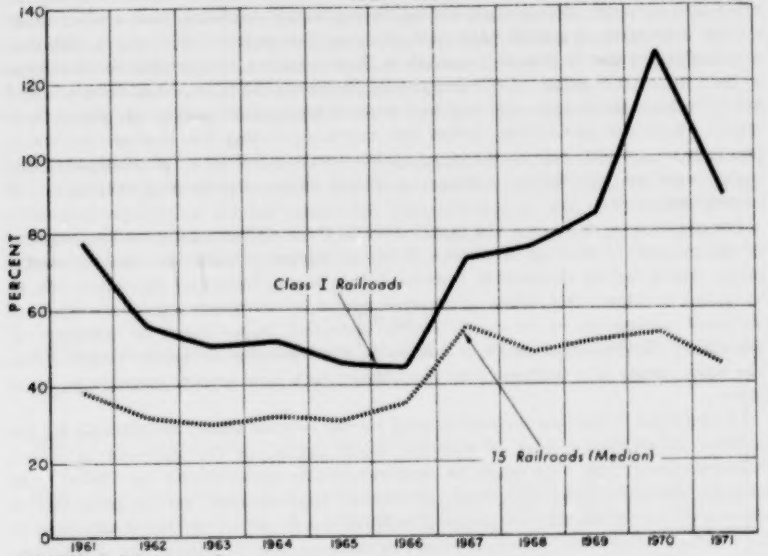
The market value of rail common stocks over this time period was only about 56 percent of the book cost of equity. In contrast, industrial stocks averaged 200 percent of equity over the same period. The ratio of other regulated industries was in the range of 150-200 percent during the 1961-1970 period.

Foster makes the following observation about common stock market values generally:

> The market values of the common stocks of industrials and regulated industries other than the railroads are explained by varying factors, including increased earnings, market evaluation of growth potentials, the rise of monetary values due to inflation, and optimism under bull market conditions. Some of these factors influence from time to time the market prices of railroad stocks. However, the behavior of railroad stock prices reflects the exceptional risk and inferior investment quality. Market-to-book ratios, which are persistently below the levels prevailing for common stocks of generally comparable regulated and unregulated businesses, are a clear indication that equity earnings are below earnings available from alternative investments of corresponding risk.
>
> The question is, of course, the significance of these differences in market behavior for the purpose of earnings regulation. Earnings regulation should not destroy market values which reflect reasonable investor expectations. However, regulation has no obligation to allow a fair return on whatever prices investors may pay for the stocks of regulated companies or to satisfy overly optimistic expectations of investors or speculators. Gyrations in the stock market do not represent changes in business risk. The basic nature of a business does not change each time market averages go up or down.
>
> The question is whether the market data for the railroad stocks are relevant for the purpose of estimating cost of common stock capital or for fair rate of return determinations. The differences in market-to-book ratios shown by Chart 7, as between railroad stocks and other investment opportunities, are so great that it appears uncertain whether the prices of railroad stocks reflect investor evaluations of the worth of prospective earnings relative to earnings of other enterprises of generally similar risk. This uncertainty makes it necessary to give careful consideration to the behavior of railroad stock prices in relation to per-share earnings and dividends ***.

Foster also reviewed the trend of railway operating income and equity income. Chart 8, below, shows that income from rail operations plunged from more than twice fixed charges in 1966 to less than fixed charges in 1970.

CHART 8
RATIO OF FIXED CHARGES TO NET RAILWAY OPERATING INCOME
1961—1971



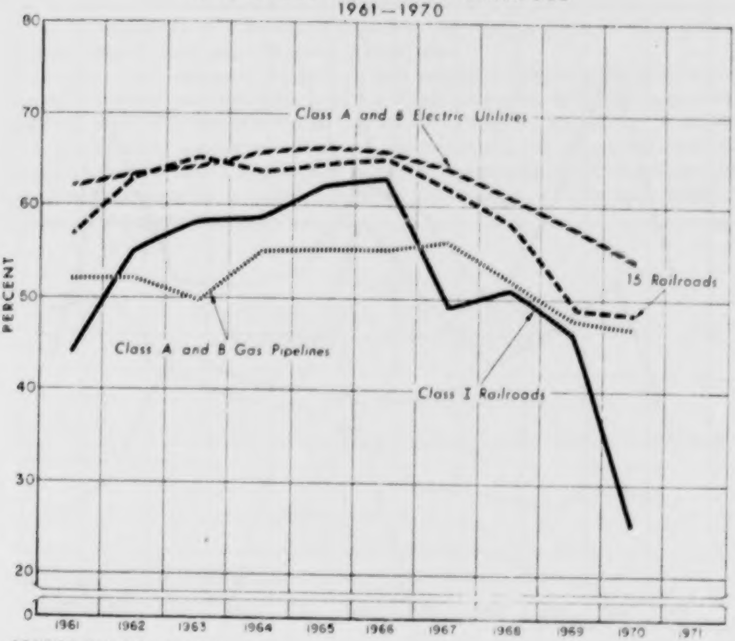
SOURCE: Exhibit page 5

In 1971 a small margin of operating income over fixed charges was achieved. To Foster, this record illustrates great financial instability. For the 15 railroads of better quality, the 1967-71 inflationary period has had a less serious impact. Since 1967, their fixed charges have been about 50 percent of net railway operating income. For many railroads, income from railway operations is an erratic and declining proportion of railroad earnings. Chart 9, below, shows comparative ratios of equity income to total income for electric utilities, gas pipelines, and the railroads for the 1961-1970 period.

CHART 9

RATIO OF TOTAL EQUITY INCOME TO INCOME AVAILABLE FOR FIXED CHARGES

1961—1970



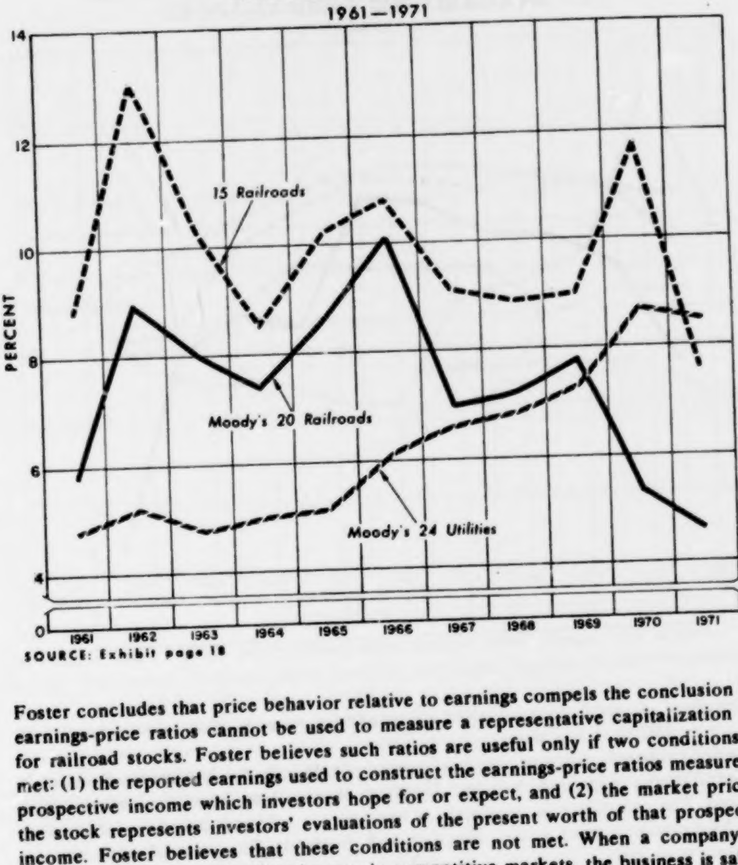
SOURCE: Exhibit page 17

Equity share of total income reached a high of 64 percent in 1966 but declined to 25 percent in 1970.

Market evidence of equity cost is a process of inferring the rate at which investors are capitalizing expected income. Investor expectations must be estimated or imputed. The conclusion is, explicitly or implicitly, a judgment based on information from past common stock prices, earnings, and dividends. The price of a stock varies inversely with risk.

Earnings-price ratios are sometimes said to be a measure of an investor's return requirement. Chart 10 below, shows the average annual earnings-price ratios for 15 railroads, for Moody's 20 railroads, and Moody's 24 public utitilies in the 1961-1971 period.

CHART 10
EARNINGS-PRICE RATIOS
1961—1971



SOURCE: Exhibit page 18

Foster concludes that price behavior relative to earnings compels the conclusion that earnings-price ratios cannot be used to measure a representative capitalization rate for railroad stocks. Foster believes such ratios are useful only if two conditions are met: (1) the reported earnings used to construct the earnings-price ratios measure the prospective income which investors hope for or expect, and (2) the market price of the stock represents investors' evaluations of the present worth of that prospective income. Foster believes that these conditions are not met. When a company has uncertain prospects of holding its own in competitive markets, the business is said to be subject to extraordinary risks and speculative market evaluations, sometimes falsely indicating a decline in investment risk and capitalization rate even though the capitalization rate is in fact rising. The prices of railroad stocks relative to earnings have been erratic, thus in Foster's opinion, reflecting factors other than investor evaluations of prospective earnings.

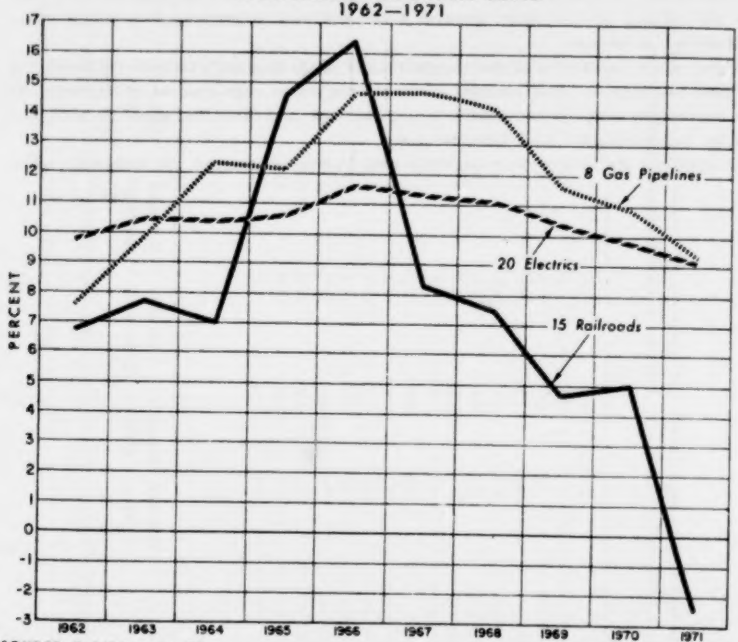
A second possible analytical approach is what Foster calls the market value method. This approach uses market price of common stock in a relation to earnings, dividends, and growth rates as evidence of investors' return requirements, a variation of the so-called discounted cash flow method. The concept is that the return required by investors is measured by the annual discount rate which, when applied to a future flow of dividends or other benefits anticipated by investors, equates to the price which they are willing to pay in order to be entitled to the benefits, i.e., the present market price or value of the stock. In short, the value of the stock is the estimated discounted present worth of the future stream of anticipated benefits from the ownership of the stock. This translates to a formula which sums the current dividend yield plus the expected annual percentage dividend growth rate.

In Foster's view, this approach fails to give meaningful results when past earnings have been unstable and future earnings are highly uncertain. When earnings are not subject to investor estimation within a reasonable range of probability, a common stock is inherently speculative. Chart 11, below, shows the discounted cash flow method applied to the 15 railroads of relatively better quality and shows that their composite performance provides no basis for estimating investors' subjective evaluation of prospective earnings.

CHART 11

DIVIDEND YIELD PLUS FIVE-YEAR EARNINGS GROWTH RATE

1962—1971



SOURCE: Exhibit page 21

For the mid-1960's, Foster believes that the 20 electric utilities had an investor capitalization rate of some 11.5 percent. The earnings experience and market behavior of the electric utilities was at that time sufficiently stable so that investor return expectations could be estimated with reasonable assurance under the discounted cash flow method. In Foster's opinion, the return requirement for railroad stocks is considerably higher due to relatively inferior investment characteristics. The amount of such increase is a matter of judgment in light of other evidence of relative risk characteristics. Foster notes that such a return benchmark is deficient in the absence of an adjustment for experienced inflation. Applying only a measure of the current cost of capital without adjusting for past inflation may otherwise dilute the reasonable investment value of already committed capital, in Foster's opinion.

Turning now to the so-called comparable earnings approach, Foster studied experienced rates of earnings on book equities of companies in other industries as evidence of what the railroads should be allowed an opportunity to earn. The comparable earnings approach assumes that it is reasonable to estimate the return required from investment in the given industry or utility by looking to the rates earned on book capital by other industries or companies of generally comparable risk. All industries and companies must obtain their capital in the same national market. They are all subject to the same general economic and related factors which affect probability of income.

Some of the limitations of the comparable earnings approach include the following: (1) past earnings on book equities of other companies, regulated or unregulated, do not necessarily measure reasonable future earnings, and (2) actual earnings often may not be commensurate with business risks.

In applying the comparable earnings test, Foster considered the following table:

Earnings on average book common equity 1957-1971

Year	Class I railroads	Fifteen railroads	Class A&B electrics	20 large electrics	Class A&B Gas pipelines	Ten truckers[1]	Eleven Domestic trunklines[1]	Bell system	Moody's 125 industrials
					Percent				
1957	4.4	5.8	11.0	12.2	12.8	19.5	8.8	8.5	13.7
1958	3.5	5.5	11.0	11.1	11.8	11.6	7.2	9.0	10.4
1959	3.4	5.2	11.2	12.2	11.5	18.8	10.8	9.6	11.9
1960	2.5	4.6	11.3	12.2	11.7	7.5	6.4	9.8	11.1
1961	2.2	4.4	11.2	12.2	11.0	12.3	3.0	9.4	10.6
1962	3.3	5.2	11.7	12.5	11.9	15.8	6.6	9.3	11.8
1963	3.7	5.1	11.8	12.5	10.8	17.7	14.6	9.3	12.7
1964	3.9	4.8	12.3	13.1	12.7	20.8	19.6	9.5	14.3
1965	4.7	5.3	12.6	13.6	12.1	23.3	26.8	9.4	15.3
1966	5.1	5.7	12.8	13.7	12.7	19.2	24.6	9.8	14.3
1967	3.0	4.6	12.8	13.6	13.7	9.0	15.4	9.6	12.7
1968	3.3	4.4	12.3	13.2	13.1	17.0	9.4	9.2	13.4
1969	2.9	4.2	12.2	13.1	12.6	9.6	7.6	9.5	12.6
1970	1.3	4.1	11.8	12.5	12.5	5.6	1.7	9.2	10.4
1971	----	3.6	----	12.2	----	18.4	3.6	9.1	11.5
1961-1970 average	3.3	4.8	12.2	13.0	12.3	15.0	12.9	9.4	12.8

[1] Represents median.

Source: ICC, *Transport Statistics in the U.S.;* FPC *Statistics of Privately Owned Electric Utilities in the U.S.* and *Statistics of Interstate Natural Gas Pipeline Companies;* Moody's *Public Utility Manual* and *Transportation Manual;* Standard & Poor's *Trade and Securities Statistics;* Annual Reports to Stockholders.

Foster also specifically considered the averages for the 1961-1970 decade as follows:

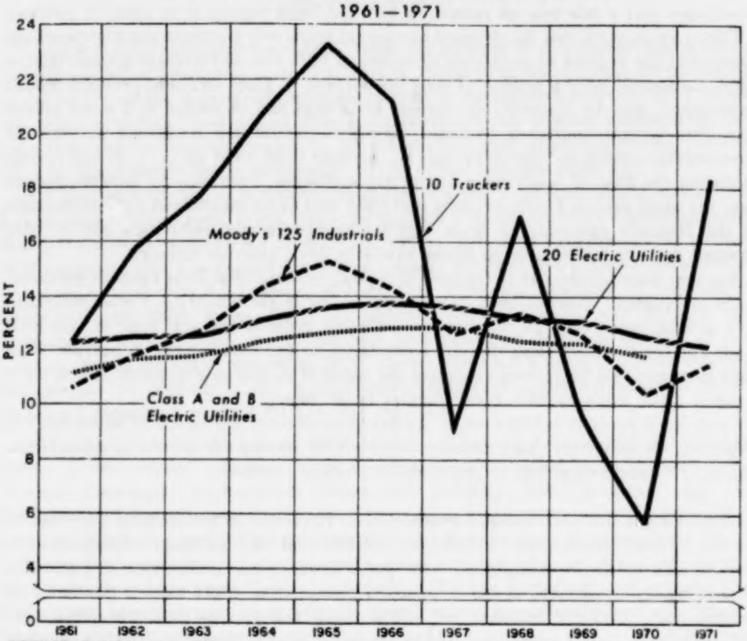
	Percent
Bell System	9.4
Classes A and B electric utilities	12.2
Classes A and B gas pipelines	12.3
Moody's 125 industrials	12.8
11 domestic trunklines	12.9
20 electrical utilities	13.0
10 truckers	15.0

Foster's first conclusion is that the investment quality of railroad equity as a class is better than that of the trunklines and the truckers, but inferior to that of other industry groups. Foster then turns to the average rates of earnings on book equities for 1961-1970 as a level of earnings which is representative of typical investment risk and investor return requirements. Foster also considered the trend of earnings over the 1960 decade in relation to the changing conditions determining investment risk and cost of equity capital. Chart 12, below, shows the trend in average rates of earnings on book equities for the electric utilities, Moody's 125 Industrials and the 10 truckers.

CHART 12

RATE OF RETURN EARNED ON AVERAGE BOOK COMMON EQUITY

1961—1971



SOURCE: Exhibit page 22

Foster avers that the truckers' experienced earnings vary so greatly that the average is not a useful indicator of investor expectation.

Foster believes the two principal benchmarks for the estimation of return requirements on equity are provided by the 20 electric utilities and Moody's 125 Industrials. Foster advances that upward adjustments must be made to both, however, to reflect the greater investment risk inherent in railroad stocks. Moreover, Foster states that the average for the decade of the 1960's is not representative of the cost of common equity at the time his study was made in 1972. The cost of equity has increased over more recent years while actual earnings have declined. Foster maintains that attrition of actual equity earnings of the electric utilities after 1966 resulted from three principal causes: (1) the rise of operating expenses relative to revenue provided by a given rate structure; (2) additions to plant at costs higher than past costs of equivalent capacity; and, (3) the rapid increase in fixed charges. Foster, therefore, believes that rates of earnings on book equities in recent years for electric utilities are inappropriate as a benchmark for the purpose of determining reasonable earnings because the trend was downward in the face of a rising cost of equity capital. Foster suggests that to obtain a useful benchmark of a prospective earnings opportunity to be afforded to the railroads, one must look back to the mid-1960's, when the level of earnings of electric utilities, as well as industrial companies, reached 13-14 percent. Given that the risks of the railroads are greater than those of the electric utilities, as well as of the more successful industrial companies, and taking into account the relative risks due to the differences in capital structure, Foster concludes that a fair rate of return on railroad book equity is at least 14 percent.

Foster anticipates that the demand for capital funds will continue at a high level. He found that the volume of corporate financing in 1971 was 223 percent greater than in 1964, compared with a growth of only 66 percent in gross national product. Foster determined that, by contrast, the volume of savings had increased at a much slower rate. Net savings, including personal savings, undistributed corporate profits, and government surplus increased by only 32 percent from 1964 to 1971. Gross savings including the flow of funds from depreciation charges, were only 53 percent greater over the same period. Foster projects that there will be an increase in the commitment of the Nation's economy to more highly capital-intensive industries and a rising demand for capital relative to funds available from internal sources.

Another cause of the rise in the cost of capital, perhaps of at least equal importance, is the widespread concern over inflationary trends in the economy. Foster maintains that interest rates tend to rise because inflation reduces the real cost of borrowed funds for the borrower and thereby contributes to the inducement to borrow. With both investors and borrowers expecting the value of money to depreciate, the level of interest rates tends to rise, other factors being equal.

Foster's 14-percent equity cost of capital is necessarily the result of an exercise in judgment. He states that no formula exists for determining the cost of common stock capital. In conclusion, Foster made the following comment:

> In arriving at this conclusion, I proceeded by reference to benchmarks provided by market capitalization rates of electric utilities and the earnings experienced by electric and industrial companies, with due allowance for differences in risks. The risks of equity investment in the railroads is greater than in the case of public utility groups, other than the truckers and the airlines, and greater than the industrials.
>
> Combination of the embedded and prospective cost of senior capital, at the debt ratio of 42 percent, with an estimated minimum cost of 14 percent for the common stock capital, gives the following indication of the range of cost of total capital and earnings standard:

	Cost rate	Capital structure ratio	Cost of total capital
	Percent	*Percent*	*Percent*
Senior capital	4.87—5.50	42	2.05—2.31
Equity capital	14.0	58	8.12
Total		100	10.17—10.43

> My conclusion is that the Commission should establish a standard of at least ten percent as the allowable rate of return for determining just and reasonable railroad rates. The Commission should undertake to provide for the railroads an opportunity

actually to earn, to the extent they may be able to do so, a return consistent with this earning standard. Otherwise, a fair rate of return determination will have no meaning as a standard for earnings regulation.

FEDERAL AGENCIES

Department of Transportation.—DOT views the purpose of this proceeding as being the delineation of principles and criteria to be followed in determining a reasonable rate of return on the appropriate investment base in the railroad industry. DOT states that this proceeding "presents an excellent opportunity to improve substantially the principles and criteria applicable to general freight rate proceedings and thereby improve significantly the performance of the entire railroad industry."

DOT proposes the use of projected funds flow analysis as an appropriate method for determining revenue need levels. Such an analysis is to be based on historical funds flow and trends in productivity of labor and capital cost over a representative period. DOT maintains that a projected funds flow method will lead to a more efficient use of resources in the railroad industry and tend to eliminate obsolete or improperly capitalized rate base items. Such an analysis, DOT believes, will provide the Commission with a much more complete and informed financial picture of the industry than is presently available. DOT claims that such a method will enable the Commission to determine the economically justifiable costs which need to be recovered through a general freight rate increase.

DOT also proposes the use of productivity analysis in determining the revenue needs of the railroad industry. Such an analysis is designed to promote a more efficient allocation of resources within the industry. DOT proposes that the Commission "base revenue adjustment and revenue levels on forward projections of revenues based on expected market reactions to present and prospective rates." Such estimates are to be related to anticipated sources and uses of funds in the industry for the future. Projected funds flow is expected to lead to a revenue policy "suited to attain a rate of return consistent with the degree of risk experienced by the industry." Projected funds flow would be expected to lead to a revenue policy "resulting in a funds flow adequate to cover projected costs of labor, capital, and intermediate outputs given a projected rate of output growth, projected rates of change in labor, capital and total fact or productivity and projected rates of change in wages and prices, including the cost of money." Projected funds flow, it is believed, would give the Commission the ability to set the level of rates based upon the "economically justified costs."

In considering the flow of funds method, DOT sets forth some basic definitions fundamental to the concept. DOT describes the railroad industry as being like that of any other enterprise or group of enterprises, that is, it may be described as an economic activity which—through a mix of inputs—labor, capital, supplies, and land—produces an output. Any industry is characterized by inflows and outflows of funds. Funds inflows represent the dollar or market value of its output. Funds outflows represent amounts paid out for labor, capital goods, supplies, and land—the so-called factors of production. There are four general sources of inflowing funds—decreases in assets, increases in liabilities, increases in equity, and income. The four general uses or applications of funds are the reverse—increases in assets, decreases in liabilities, decreases in equity, and expenses. For example, when an enterprise sells an asset, funds flow in, and when it buys an asset, funds flow out.

Table 1, below, shows the gross flows in the railroad industry for the 1959-1969 period, inclusive.

TABLE 1

Gross flow of funds class I line-haul railroads 1959-1969
($000,000)

	Source				Applications			
	Decrease in assets	Increase in liabilities	Increase in equity	Income	Increase in assets	Decrease in liabilities	Decrease in equity	Expense
Fund inflows:								
Railway operating revenue				110,918				
Other income				4,256				
Fund outflows:								
Labor costs								
Compensation								(53,609)
Old-age retirement								(3,246)
Unemployment								(1,383)
Capital and intermediate costs:								
Nonlabor operating expenses								(25,648)
Depreciation								(7,634)
Rents:								
-Equipment				1,743				(6,984)
-Leased lines								(600)
Dividends							(4,878)	
Interest and amortization						(4,376)		
Misc. deductions from income				(812)				
Extraordinary and prior period items							(309)	(80)

Gross flow of funds class I line-haul railroads 1959-1969—Continued
($000,000)

	Source				Applications			
	Decrease in assets	Increase in liabilities	Increase in equity	Income	Increase in assets	Decrease in liabilities	Decrease in equity	Expense
Retirements								
U.S. Income tax				(1,760)				
All other taxes (principally property)	(4,080)							
Discretionary flows:								
-Changes in current assets	561				(819)			
-Changes in current liabilities		1,237				(182)		
-Changes in long-term debt		1,855				(738)		
-Changes in equity			2,201				(1,724)	
-Changes in property	1,439			(5,758)				
-Changes in accrued depreciation and amortization					1,924			
-Changes in "other" investments	156				(321)			
-Changes in miscellaneous assets	8				(129)	(4,376)		
-Changes in miscellaneous liabilities	414					(125)		
Totals	(1,916)	3,506	2,201	114,345	(5,103)	(5,421)	(6,911)	(99,184)

ADDENDUM

Sources: 118,136 Applications------ 116,619
Retain income----- 1,517

118,136

Gross flows means the absolute value of both the inflows and outflows in any sector, which often occurs simultaneously. The purpose of table 1 is to suggest to the Commission how it may analyze the trends in the regulated industries and make judgments as to whether such trends are desirable and should be encouraged, or are undesirable and should be discouraged. Such an anlaysis may give better clues on the economy and efficiency of railroad financial management and thereby better permit the determination of the true revenue requirements of the industry.

Some of the more significant shifts associated with inflows are discussed below. Table 1 shows that current assets decreased $561 million and simultaneously increased $819 million, for a net increase of $258 million. Examination of the underlying detail shows, in DOT's opinion, that liquid assets decreased while accounts receivable increased. In DOT's mind, this raises questions on the industry's collection practices and internal management practices, particularly in view of the industrys' chronic cash shortages.

Over the same time period, current liabilities increased $1,237 million and at the same time decreased $182 million for a net increase of $1,055 million. Again, in an examination of the underlying detail, DOT questions the internal funds management practices of the industry, considering that accrued accounts payable increased almost 100 percent over the 10-year period. Table 1 also shows that equity increased a net of some $477 million, while long-term debt had a net increase of $1,117 million. This illustrates the trend of greater reliance on debt and less on equity in the railroad industry. Table 1 shows the property accounts having a net increase of $4,319 million. While miles of road decreased during this period, the rolling stock account stayed about the same, but tonnage and motive power capacity increased, indicating a trend toward a higher density/capacity per mile of road and a trend suggesting the development of a more productive capital plant.

Taxes, other than Federal income, old age retirement, and unemployment, are shown as a charge against inflows from a decrease in assets rather than added expense as in the case of unemployment and retirement taxes. This is done because DOT believes these taxes are principally property taxes and represent the transfer of property value from the industry to the taxing authorities. The effect is to treat these taxes as a "negative inflow," that is an outflow. DOT believes that this problem reflects the industry's longstanding complaint about State taxes and should be taken into account in evaluating revenue needs.

DOT presents the following gross inflow table from table 1.

Inflow of funds class I line-haul railroads—1959-1969

	Percent
Decrease in assets	-1.62
Increase in liabilities	2.97
Increase in equity	1.86
Income	96.79
Total	100.00

To DOT, this table suggests the relative importance of equity and of debt financing during the 1959-69 period. DOT also notes the "overwhelming importance of income."

In considering the more significant shifts associated with outflows of funds, DOT notes the following. Over the 10-year period, compensation, old age retirement taxes, and unemployment taxes accounted for 49.30 percent of total outflows. Thus, DOT concludes that, while the railroad industry is sometimes considered to be a capital intensive industry, this percentage suggests that the industry is also labor intensive, despite a great deal of attention focused on the need for capital goods.

The following table shows the changes in equity over the 1959-69 period.

TABLE I

Changes in equity class I line-haul railroads 1959-1969
($000,000's)

	Increase	Decrease
Common stock		(619)
Preferred stock		(467)
Capital surplus	924	
Retained income—appropriated		(637)
Retained income—unappropriated	270	
Miscellaneous	7	
Totals	2,201	(1,723)

DOT notes from table I that funds flowed out of the industry for the following purposes.

Outflow of funds class I line-haul railroads 1959-1969

	Percent
Increase in assets	4.32
Decrease in liabilities	4.59
Decrease in equity	5.40
Expenses	83.96
Excess of inflow	1.28
Total	100.00

DOT believes the increase in assets results principally from the growth in rolling stock or equipment; the decrease in equity is believed principally to be due to a decrease in stock outstanding. Table 2, below, combines the flows of funds to show the net effect of the simultaneous changes.

TABLE 2

Net of funds class I line-haul railroads 1959-1969
($000,000's)

	Assets	Liabilities	Equity	Income and expense
Fund inflows:				
Railway operating revenue				110,918
Other income				4,256
Fund outflows:				
Labor costs				
Compensation				(53,609)
Old-age retirement				(3,246)
Unemployment				(1,383)
Capital and intermediate costs:				
Nonlabor operating expense				(25,648)
Depreciation				(7,634)
Rents:				
-Equipment				(5,241)
-Leased lines				(600)
Dividends			(4,878)	
Interest and amortization		(4,376)		
Miscellaneous deductions from income				(812)
Extraordinary and prior period items			(309)	
Retirements				(80)
U.S. income tax				(1,760)
All other taxes (principally property)	(4,080)			

Net of funds class I line-haul railroads 1959-1969
($000,000's)

	Assets	Liabilities	Equity	Income and expense
Discretionary flows:				
-Changes in current assets	(258)			
-Changes in current liabilities		1,055		
-Changes in long-term debt		1,117		
-Changes in equity			477	
-Changes in property	(4,319)			
-Changes in accrued depreciation and amortization	1,924			
-Changes in "other" investments	(165)			
-Changes in miscellaneous assets	(121)			
-Changes in miscellaneous liabilities		289		
Totals	(7,019)	(1,915)	(4,710)	15,161

Table 2 shows seven types of outflows connected with the acquisition of capital growth, as follows, which together accounted for 22.17 percent of all net outflow.

Outflows for capital goods class I line-haul railroads 1959-1969

	Percent
Depreciation	6.36
Equipment rents	7.48
Leased line rents	0.46
Dividends	3.73
Interest and amortization	4.08
Retirements	0.06
Total	22.17

DOT maintains that about four-fifths of the capital goods acquired were paid for by internal cash throw-off (including interest and amortization) while only one-fifth were acquired by equity financing involving dividend payouts. During the 1959-1969 period, depreciated investment averaged $26,068 million. DOT believes there was a cash throw-off of 8.56 cents per dollar of depreciated investment available for the acquisition of capital goods.

Table 2 shows that the industry realized $15,161 million after payment of all operating expenses, including depreciation and taxes. The following table shows the disposition of these funds.

Outflow of funds available after operating expenses and taxes class I line-haul railroads 1959-1969

	Percent
Increase in assets	46.29
Decrease in liabilities	12.63
Decrease in equity	31.07
Retained income	10.01
Total	100.00

DOT believes that the above discussion has shown how the Commission might evaluate trends in inflows and outflows. It avers that when these data are considered in conjunction with productivity data, discussed in the next section, such trends can give valuable insight into future revenue needs of the railroad industry.

DOT argues that to use funds flow analysis most effectively requires projections of capital and labor costs. Ratios and average annual rates of change derived from productivity analysis should also be considered. Revenue needs are believed to include a reasonable return on investment.

Table 3, below, shows indexes of productivity, input unit costs, and output unit costs for the railroad industry for the years 1956-69. These years cover the period from just prior to the 1958 recession to the period immediately preceding the present (1972) sluggish economy and, therefore, give an idea of the impact of volume changes on railroad productivity. The input unit costs shown in table 3 correspond to the income statement outflows shown in table 2.

It will be seen that there was a sharp drop in labor productivity in 1957, when ton-miles dropped sharply.

Indexes of productivity, input unit costs and output units costs
Class I line-haul railroads—freight operations 1956-1969
(1956 = 100.0)

	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Productivity:														
Ton-miles per employee	100.0	97.9	101.9	109.5	113.8	121.4	131.1	142.2	153.5	169.2	181.2	181.2	187.9	198.9
Ton-miles per mile of road	100.0	96.0	85.9	90.0	89.6	88.2	93.7	98.6	104.2	113.0	119.8	116.7	121.7	124.8
Ton-miles per total factors	100.0	97.9	97.6	103.5	106.0	109.7	117.2	124.9	132.5	145.5	154.4	152.9	171.3	176.9
Input unit costs:														
Compensation per employee	100.0	112.0	121.1	127.9	132.1	136.5	141.9	145.8	15[illegible].5	162.7	169.7	177.8	217.7	234.1
Other expense per mile of road	100.0	92.9	83.9	89.3	89.0	87.7	92.7	96.6	104.1	108.4	116.4	118.8	107.0	118.7
Price-wage index	100.0	104.7	107.2	113.2	115.5	117.4	122.2	125.6	132.0	139.8	146.8	152.4	178.3	191.4
Output unit costs:														
Compensation per ton-mile	100.0	114.3	118.8	116.8	116.1	112.5	108.2	102.5	99.3	96.2	93.6	98.1	115.9	117.7
Other expense per ton-mile	100.0	96.7	97.6	99.2	99.3	99.4	99.0	97.9	99.9	96.0	97.1	101.9	87.8	95.1
Total expense per ton-mile	100.0	106.9	109.8	109.4	109.0	107.0	104.3	100.6	99.6	96.1	95.1	99.7	104.1	108.2

Source: Computed from *Transport Statistics in the United States*, Interstate Commerce Commission.

The industry's response to this drop in productivity has been to reduce employment in 1958 and every year thereafter. The table shows labor productivity increasing every year between 1958 and 1969, the average annual rate of increase being 5.4 percent. Capital productivity, measured in ton-miles per mile of road, also dropped sharply in 1958 and did not regain its 1956 level until 1964, the same year in which ton-miles regained their 1956 level. DOT concludes that the growth in capital productivity was slower, the average annual rate being only 1.7 percent, the composite rate for these two factors being 4.5 percent.

The average annual employee compensation showed a fairly modest average annual rate of increase until 1968 when it increased sharply. The average annual rate of increase was 6.8 percent which represents some pass-through of labor cost increases to rates, since this rate of increase was not matched by the increase rate of labor productivity. On the other hand, nonlabor expense was actually below 1956 levels through 1968 (probably due to economizing) and thus showed an average annual rate of increase of only 1.3 percent. DOT concludes that since the rate of increase in capital productivity exceeded this rate, it was not necessary to pass any of this class of expenses through to rates. The overall effect of these two offsetting trends was a weighted average input cost index of 191.4, representing an average annual rate of increases of 5.1 percent. DOT concludes that since the rate of growth of total-factor productivity was less than this, part of the increase in cost created a revenue need, since it was passed through to output unit cost and had to be covered by rate adjustments.

DOT avers that since average compensation rose during the period 1956-1958, inclusive, while labor productivity was stagnant, labor cost per ton-mile had to have risen during this period. However, from 1959 to 1966, inclusive, labor productivity rose faster than compensation and consequently labor cost per ton-mile declined. However, in 1967 labor cost began to rise faster than productivity, consequently labor cost per ton-mile increased at a very rapid rate. The 1967 increase was probably due to a decline in ton-miles that year and the 1968-69 increase was probably due to a catch-up collective bargaining agreement with additional pressures being created by the decline in real wages due to the rise in consumer price index. The 1956-1969 overall average annual rate of increase in labor costs per ton-mile was 1.3 percent.

The overall effect of movements in productivity and input unit cost is shown on the total expense per ton-mile, which rose during the period 1956-59, declined during the period 1960-66 until it was below the 1956 level and then rose during the period 1967-69, with the overall average annual rate of increase being 0.6 percent.

The purpose of this section has been to show how productivity changes offset changes in factor prices and wages. The next section will show how this information may be used to estimate future revenue needs. In DOT's view effective rate regulation requires establishing a "general level of rates adequate to cover the costs of an efficient allocation of resources, including a reasonable return on investment." DOT believes that the costs to be considered "should not be limited to the costs of obtaining labor and capital goods used and useful in the business but should also take into account external and social costs such as the costs of maintaining the environment and of advancing safety and health." DOT believes that its projected funds flow method will meet this objective. DOT believes that its projected funds flow analysis should be similar to that illustrated in tables 1 and 2, *infra*.

DOT believes that the following matters should be considered in evaluating a projected funds flow method. During DOT's study period of 1959-1960, DOT found that ton-miles grew at an average rate of 1.32 percent per year. DOT believes that this is a reasonable growth rate for the Commission to use in projecting output, since this period covers a cyclical period of economic activity. DOT would also project a 5.4-percent per-year increase in labor productivity in the near future, taken from its 1956-1969 study period. Combining these two figures, DOT finds a 3.88-percent annual decrease in employee requirements. DOT finds that employee compensation increased at a rate of 6.8 percent per year during its study period. It believes that 6.8 percent is "probably close to the long-range trend figure although it may be expected to be exceeded in the short term." Combining the trends in decreasing labor requirements and increasing wages results in an annual growth rate in total labor compensation according to DOT, of about 2.67 percent per year. Similar rates-of-change analyses are conducted on such things as capital productivity, miles of road, nonlabor expense trends, trends in aggregate nonlabor costs and overall effects on output unit costs, among others. DOT finds that the cost of obtaining capital goods comprised some 22.17 percent of fund outflows during the 1959-1969 period distributed as shown on page 38 of this appendix. DOT argues that equipment rentals and interest and amortization should increase as percentages of total outflow and all other classes of financing should decrease. DOT believes that the proportions of this financing mix are of fundamental importance to the regulatory process. DOT maintains that the Commission needs to determine if it desires this trend to continue—that is, greater reliance on debt and rent, and less on equity financing—or if the Commission wishes to reverse this trend. DOT advocates that the fundamental consideration should be to set a capital structure that will obtain the required capital goods at the lowest total overall cost. DOT advances that a second consideration should be that the ratepayers do not pay a disproportionate part of this cost by excessive reliance on so-called "above the line" financing techniques. These considerations, in turn, require a determination of the amount of funds required to attract equity capital. Some determination of technological goals is also necessary. DOT claims that if it is determined that it is desirable to replace rail technology with more advanced systems at more frequent intervals, then this would require both larger increments of new assets and higher retirement expense. These levels must also be measured and taken into account in computing revenue need.

Attached to the DOT statement are three appendixes, one on rate of return on investment, one on risk analysis, and one on financing methods and associated risk. Considering rate of return, DOT cautions that there is a basic inherent deficiency in automatically associating revenue need with rate increases, let alone equating a low accounting rate of return with a revenue need. DOT states that revenue need may be fulfilled by increasing rates or by decreasing rates, depending on whether the price elasticity of demand for a commodity is high or whether it is low. DOT concludes that the issues of rate base and rate of return are clearly related to the issues of rate structure and rate level. While DOT does not necessarily agree with many of the conjectures that led to the institution of Ex Parte No. 271, it does believe that rate base as presently computed is substantially overstated relative to the market value of the investment.

DOT believes that rate of return alone, even if properly computed, would be inadequate as a sole criteria of revenue need. Referring to several public utility cases, such as the *Bluefield* and the *Hope* cases, *supra*, DOT states that there appears "to be no sound reason for not applying the same public utility concept of comparable earnings for comparable risk to the railroad industry."

DOT's risk analysis is based on a regulatory objective under the national transportation policy calling for "adequate, economical, and efficient service" which assumes that to provide adequate service, carrier returns must be high enough to attract and hold the needed capital. Since railroads compete for money in the open capital market (against both regulated and unregulated enterprises) rail returns should be comparable to other companies having similar investment risks. DOT believes that efficiency should not be ignored and that all factors of production should be considered. Significant excess capacity, excessive executive wages, excessive subsidiary profits, and other inefficiency should not be harbored simply because they can be passed on to the ratepayer. In DOT's view, the railroads "should be entitled to earn comparable returns for comparable risks, and in so doing, should earn returns high enough to attract needed debt and equity capital."

DOT attempts to apply the so-called "instability of earnings" theory in its risk analysis. Instability of earnings is a risk factor. So too is growth in sales as a variable in explaining the difference in rates of return among firms and industries. DOT's formula includes a factor for volatility of earnings, growth of sales, fixed charge coverage, and a factor for regulation. Applying its equations, DOT finds that, instead of a 1969 net income after taxes (but before fixed charges) of $1,066 million that the railroad industry earned, the industry should have earned $1,578 million. Adjusting to consider rents as fixed charges, the goal of $1,578 million should be further increased to $1,766 million, which DOT maintains puts the railroad industry in line with other industries.

Considering financing methods and associated risks, DOT notes that it is clear that there are different levels of risk associated with different methods of obtaining capital goods. DOT finds that the railroad industry has a debt ratio of 37 percent (debt as a percent of total capital). While this debt level is significantly greater than the 25 percent for the 20 manufacturing industries studied, it is far below the 50 percent in regulated utilities, 47 percent in trucking, and 62 percent in air transport. It is little different from the 36-percent debt in the shipping group. The following table sets forth these relationships in more detail.

Selected financial items

Manufacturing industries, regulated utilities, transportation companies, Class I railroads, and selected railroads[1]

Items	20 manufacturing industries	Regulated utilities	Trucking	Shipping	Air transportation	Class I railroad
Yield on common stock (percent)	3.04	3.89	2.72	2.71	1.49	4.80
Fixed charges as percent of debt[2] (percent)	6.76	3.77	7.20	5.19	4.64	3.69
Times fixed charges earned after F.I.T. (times)	7.33	3.47	3.72	2.91	2.40	2.45
Common stock price earnings ratio (times)	17.14	17.25	13.64	[3]21.23	14.71	13.56
Capital turnover ratio (times)	1.50	0.32	2.52	0.92	1.04	0.38
Compound annual growth rate of net sales as revenue (percent)	12.50	7.10	15.55	7.88	15.09	2.80
Debt to total invested capital[4] (percent)	25.44	49.91	46.88	36.47	61.93	37.02
Increase in 1970 debt to total invested capital over 1961-1970 average (percent)	27.55	4.54	13.01	74.00	6.34	7.46
Ratios of other industries to manufacturing industries (times)						
Yield on common stock		1.28	0.89	0.89	0.49	1.58
Fixed charges as percent of long term debt		0.56	1.07	0.77	0.69	0.55
Price earnings ratio		1.00	0.80	1.24	0.86	0.79
Capital turnover ratio		0.21	1.68	0.61	0.69	0.25
Compound annual growth rate net income		0.57	1.24	0.63	1.21	0.22

Source: Data derived from Compustat Data, Moody's Transportation Manual, and AAR Data.

[1] Unless otherwise stated, data are 10-year averages for the period 1961-1970.

[2] Fixed charges excluding rentals as a percent of total long-term debt.

[3] Figure is distorted due to abnormal ratios in 1960 (18.33), 1967 (71.84), 1968 (55.04), 1969 (33.50).

[4] Equity plus long term debt.

n.a.—not available.

DOT notes that the average interest rate on a long-term debt of the railroads is steadily increasing from very low interest rates to much higher ones. In 1971 railroad bonds yielded 8.43 percent (yield to maturity) while industrial bonds yielded 7.80 percent and utility bonds 7.71 percent. DOT notes the low fixed charge coverage ratio of the railroads. The railroads covered their fixed charges only 2.45 times, while manufacturing industries covered their fixed charges 7.33 times, regulated industries (with 50-percent debt) covered their fixed charges 3.47 times. DOT avers this railroad low income-fixed charge ratio results in a higher risk, not only for the supplier of debt capital, but also for equity investors, as illustrated in the following table.

Average price of new capital

Year	Average yield to maturity railroad bonds	Average yield to maturity industrial bonds[1]	Average interest rate on railroad equipment obligations	Average yield to maturity utility bonds	Ratio of yield to maturity of utility bonds to rail bonds
			Percent		
1961	4.88	4.70	4.44	4.70	0.96
1962	4.88	4.53	4.45	4.44	0.91
1963	4.66	4.41	4.29	4.39	0.94
1964	(2)	4.51	4.40	4.56	N.A.
1965	(2)	4.80	4.52	4.68	N.A.
1966	(2)	5.52	5.32	5.61	N.A.
1967	(2)	5.79	5.83	6.01	N.A.
1968	7.40	6.64	6.61	6.72	0.91
1969	(2)	7.84	N.A.	7.99	N.A.
1970	8.75	8.88	N.A.	8.84	1.01
1971	8.43	7.80	N.A.	7.71	0.95

Sources: *Moody's Transportation Manual 1972, Transport Statistics in the United States*

[1] Weighted Averages of Yield on Newly Issued Domestic Bonds in the various industries.

[2] No new issues.

N.A.—Not available.

DOT observes that determining the cost of equity is traditionally an area of controversy. The cost of equity determination depends on judgment as to what factors cause people to buy common stock. Price-earnings ratios indicate in dollars exactly what the marginal cost of equity is at a given point in time. For the 1970-71 period, manufacturing industries averaged a 17.1 price-earnings ratio, which was about the same as for regulated utilities, and which was about 13.6 for railroads. DOT cautions that the railroad figure represents the average for only the larger and usually more affluent railroads whose securities are traded on the New York Stock Exchange, and does not reflect the experience of the entire class I railroad industry. DOT believes that there is relatively little difference in the price-earnings ratio of railroads and the manufacturing industries. DOT notes that the yield on common stock measured by dividends as a percentage of the average price of common stock, averaged 3.0 percent for manufacturing industries, 3.89 percent for regulated utilities, and 4.80 percent for class I railroads.

DOT postulates that the railroads' somewhat surprising level of price-earnings ratios relative to their alleged low returns may be partly explained by railroad common stock yields—measured by dividends as a percentage of the average price of common stock. DOT advocates that the relatively high yield for railroads may indicate either that the market assigns a low value per share to railroad common stock, or it may also indicate that management dividend policies are designed to meet stockholder expectations and thereby maintain stock prices. DOT does not believe that sales growth accounts for the prospective yields. It notes that manufacturing industries reflected a compound annual growth rate in net sales of some 12 1/2 percent, while railroad revenue grew at an average rate of only 2.8 percent annually; yet the average dividend yield was higher for railroads than for manufacturing companies.

The following table sets forth the comparative market and bookvalues of equity for the seven industry groups studied by DOT.

Ratio of market value to book value, selected industries and railroads year 1970

Industries and railroads	Book value per share	Average market price	Market to book (times)
Moody's 125 industrials	$149.55	$270.83	1.81
Moody's 25 public utilities	67.75	79.06	1.17
Compustat 20 manufacturing industries	18.06	31.54	1.75
Trucking	7.16	15.01	2.10
Shipping	16.59	12.42	0.75
Airlines	12.21	14.85	1.22
Moody's 20 railroads	90.37	65.61	0.73

Sources: 1971 Moody's Industrial and Transportation Manuals Railroads' Annual Report to the ICC Compustat file for 20 manufacturing industries, trucking, shipping, and airlines industries.

In 1970, only the railroads and ocean shipping had a ratio of market to book of less than 1.0. To DOT, the "historical record makes it very clear that the market considered the earnings and prospective earnings of industries and utilities so attractive that investors are willing to pay a multiple of the book value for an equity position in such companies but, contrariwise they consider the record and prospects for the railroads so unsatisfactory that they are not willing to pay the historic or book cost of railroad equity capital." DOT concludes:

> Thus, to a considerable extent, a high yield on common stock may reflect low investor confidence and a low yield may reflect high investor confidence as measured by the relative price which stockholders are willing to pay. This is consistent with the fact that investors are willing to pay 60 or more times present earnings to buy stock in a company like IBM or Xerox but are willing to pay only a much smaller multiple of earnings for railroad companies.

DOT also reviewed a number of deferred-purchase contracts and equipment bonds to identify common patterns and to otherwise comment on equipment financing.

GENERAL SERVICES ADMINISTRATION

GSA presents its verified statement through two witnesses; Colin Barrett and Mark Langsam. Barrett is a well-known writer in the field of traffic and transportation. Langsam is a public utility regulatory economist with GSA. GSA represents the executive agencies of the United States, excepting the Department of Defense, in their interests as substantial users of railroad transportation services.

GSA believes it is fair and equitable that railroads be afforded the opportunity to enjoy a reasonable rate of return from their carrier operations, to the extent that such returns can be generated by honest and efficient management and operating practices, and just and reasonable rates. GSA agrees that rate of return data are entitled to probative weight in any regulatory review of carrier rate changes, subject to GSA's caveat that the Commission has an affirmative obligation to the ratepayers to ensure that the rate base/rate of return computation reflects as accurately as possible "the true economic condition of the carriers." GSA states that a fundamental purpose of this proceeding must be to consider how best the rate of return may serve as an indicator of carrier revenue need—or the lack thereof—in a ratemaking context. GSA maintains this proceeding should reflect "important regulatory policy considerations as well as strictly accounting techniques." To GSA, the chief policy consideration is the public need for a strong, sound, and economically viable railroad transportation system under the national transportation policy (NTP). The NTP charges the Commission with the duty to "foster sound economic conditions in transportation *** to the end of developing, coordinating, and preserving a national transportation system by *** rail *** adequate to meet the needs of the commerce of the United States, of the Postal Service, and of the national defense."

GSA argues that to the extent that rate of return plays a significant role in the ratemaking process, the carriers should not be enabled to exercise managerial discretion to affect rates of return so as to influence the ratemaking process, to the detriment of the ratepayers, "beyond the normal dictates of carrier operations and the general economic climate in which they are conducted." GSA is concerned about such things as valuation of assets, purchase and sale transactions, multicorporate "aggregation" or amalgamation of rate of return data for evidentary purposes, and—of special importance in the contemporary railroad industry—carrier diversification into nontransportation enterprises. But GSA does not believe that "artifical regulatory barriers should be interposed by administrative fiat." GSA claims that carriers also owe a duty to the shipping public to maintain just and reasonable levels of rates and charges. Where carrier diversification adversely affects rate of return, and this, in turn, affects the ratemaking process, it is clearly necessary in the public interest that "appropriate allowances" be made, in GSA's view. GSA states that this proceeding is the proper forum for such considerations to be reviewed by the Commission.

Considering the proper composition of net investment base upon which rate of return figures are computed, GSA specifically disassociates itself from the allegations of overstated rate base which led to the institution of this proceeding. GSA does not believe that this matter can be successfully investigated by an individual party to an adversary proceeding. However, GSA claims that there exists sufficient reason for the Commission itself with the cooperation and collaboration of the railroad industry, and other interested parties to reexamine certain of the concepts and calculations that are involved in the production of that investment valuation data, and to require adjustment of the investment values as may be deemed necessary as the result of such reexamination.

GSA submits the following guidelines:

(1) Each unit of investment should represent no more than the actual financial outlay on the part of the owning carrier.

(2) Regardless of the actual dollar outlay by carriers in acquiring property or equipment, no unit of investment should be valued above that level determined by the Commission to represent a reasonable and prudent economic investment. GSA believes that this can, essentially, be done on an exception or sampling basis by the Commission.

(3) Absent the most compelling reasons, no article of carrier property or equipment should be reflected in the investment base at an amount higher than its net worth at the time it was first devoted to railroad operations. GSA emphasizes that in no case should a subsequent sale or purchase of such assets result in higher valuation than when the asset was first placed in public service. Any associated depreciation should be fully carried forward regardless of whoever the subsequent holder of the assets is.

(4) Except for real estate, depreciation accounting principles should be applied to all railroad operating property and equipment, unless it is affirmatively determined that alternative and accepted accounting techniques will produce an identical or closely similar result.

(5) Property and equipment is suitable for inclusion in the investment computation only to the extent that it is used and useful in railroad operations. GSA feels that to the extent that there is overcapacity in the industry, that the ratepayer should not be paying for such underutilized assets. GSA also seems to be encouraging abandonment of property that does not return even its expenses of operation "as not being used and useful in railroad operation, as that term is understood." GSA believes that all lines should be operated on at least a break-even basis. GSA claims that such an approach would have the effect of providing the carriers with an incentive to rationalize operating plant as promptly as may be possible, serve to further discourage wasteful operations and inefficiency, and contribute to placing the carriers' net investment base on a more realistic footing for the purpose of computing the rate of return.

Considering purchase and sale transactions affecting the net investment computation, GSA maintains that by the standards of today's marketplace, large portions of railroad book investment are grossly *undervalued*. GSA refers primarily to the increased market value of railroad-owned land. GSA emphasizes that when a carrier purchases railroad operating equipment or property, its investment accounts should be increased by no more than the actual purchase price paid, regardless of prior book value. GSA claims that purchase and sale transactions should be subject to "special scrutiny" by the Commission. GSA argues that ceiling prices should be set for transactions between railroads and affiliates. GSA believes that important adjustments need to be made to above-the-line net income or net railway operating income to include profits made from the sale of previously carrier-used assets such as land. GSA would have the profits from the sale of land formerly used in carrier operations "assist" carrier-only rate of return.

Considering the question of conglomerates and diversification, GSA takes the position that the carrier must be preserved as a separate financial entity. GSA believes that the rights of stockholders and investors to attempt to earn a maximum return on their investment must be tempered by recognizing the character of the industry—that of a common carrier. GSA is concerned with the depletion of assets that would otherwise be available to support rail operations in times of financial adversity. GSA specifically proposes that all nontransportation revenues (less expenses incurred in generating those revenues) of diversified carriers be included in the numerator in the rate of return calculation. GSA thus avers that all net nontransportation earnings should be added to net railway operating income before that figure is divided by net investment to produce a rate of return. Nontransportation profits now recorded under the heading of "other income" would thus be added to net railway operating income before rate of return is computed. GSA would call such an account a "diversified income account." GSA claims that only positive nontransportation contributions to a carrier's profits should be recorded in such a diversified income account. Otherwise, railroad operations would in effect be underwriting unprofitable nontransportation ventures. GSA is convinced that the public interest requires such a result. GSA would further require that a "diversified earnings reserve" account be set up. Into this account would be channeled all net revenues from nonrecurrent, nontransportation transactions, which would be allowed to earn interest at prevailing rates. Over a period of years to be set by the Commission, principal and interest could be transferred into the diversified income account based on a yet to be described formula, thus diluting and spreading the impact on carrier rate of return and avoiding any "undue and severe dislocations which might otherwise distort the true picture of carrier finances." GSA does not believe that the details are all that important in the context of this proceeding but that the concept should be recognized, in order to preserve the integrity of carrier finances. GSA also specifically urges the Commission to take such steps as may be necessary, including, as appropriate, institution of a formal rulemaking proceeding, toward defining and promulgating a fixed policy with respect to railroad participation in conglomerates, including if appropriate, presentation to the Congress of pertinent legislative proposals.

Considering the evidentiary weight to be accorded rate of return data in revenue need rate proceedings, GSA concedes that "there can be no argument" that a properly constructed rate of return computation constitutes one index of carrier revenue need, subject to several caveats.

One of GSA's caveats is that it believes that rate of return should only be considered valid revenue need evidence on a carrier-by-carrier basis. GSA would accord no evidentiary weight to rate of return data computed on a regional, nationwide, or other multicarrier basis. GSA thinks that a few carriers who suffer negative net railway operating income have a greater impact on nationwide rail data than the many profitable carriers. For example, adjusting the Ex Parte No. 281 data ending with a 12-month period on September 30, 1971, GSA found that the 2.53-percent rate of return computation increased to 3.78 percent with the elimination of the Penn Central.

The 1970 railroad dividend record is cited as further evidence of the "inutility" of averages. The railroads as an industry in calendar 1970 paid some $447.1 million in dividends—but earned only $77.8 million in net income. GSA believes that the railroads did not in fact pay out great increments of capital in the form of dividends, but rather merely that the deficit carriers did not report deficit dividends; they simply paid no dividends. Thus, the deficit carriers made negative contributions to the total net income figures while they merely made a zero contribution to the dividend payment totals. To GSA, this furnishes a "vivid illustration" of the distortions that may result from the use of averages with respect to any aspect of carrier finances, including rate of return.

GSA's second caveat is that carriers affiliated with conglomerate holding companies or with other types of companies engaged in nontransportation business activities, should be required to submit financial data relating to at least the parent company, if not all affiliates. If conglomerates with carriers are unwilling to do this, then GSA claims that no evidentiary weight should be accorded to purported carrier-only rate of return or other financial data. Where the data is submitted, properly broken down, GSA advocates that it should be reviewed for any significant disparity in rate of return between the carrier and its affiliates. Disparities may indicate a financial imbalance within the corporate structure that would suggest a review of affiliate transactions in which the carrier has participated, or other appropriate action.

GSA's third caveat is its belief that the broader fiscal environment of the carriers should be reviewed by the Commission in considering carrier revenue need questions. GSA is concerned about the possibility of corporate raiders who can neglect the primary business of a railroad in order to drain it of valuable assets and then cast aside the remaining corporate shell of a once-healthy railroad.

As a final caveat, GSA cautions against overreliance on rate of return as an index of carrier financial health. GSA is concerned about the possibility that a conglomerate/carrier may be able to show a favorable overall rate of return while conducting its railroad operations at an actual financial loss, due to the high profitability of its nontransportation ventures. GSA is convinced that such a situation should not be permitted, either in the interests of stockholders and investors of the carriers, or in the longrun public interest. GSA argues that cost-revenue comparisons, operating ratios, and other indicia relating specifically to rail transportation operations should be reviewed, along with rates of return, in any examination of overall carrier revenue need.

In considering a possible specific overall percentage rate of return to be established for the railroad industry in this proceeding, GSA maintains that under no circumstances should such a figure be construed as an "entitlement of the carriers." Rather it should be "regarded as a goal, attainment of which must depend in large part on the prudence, wisdom and efficiency of carrier management and operations, as well as the level of transportation rates." GSA advocates that rate levels should be set "sufficiently high as to afford carriers the opportunity to approach or achieve this goal; but carriers should not be held entitled to effectuate rate increases solely on the ground that their rates of return may fall below such levels as may be set by the Commission in this proceeding, with no other factors taken into consideration."

GSA claims that the 10-percent rate of return figure proposed by the railroads is "considerably out of line." GSA refers to recent (1972) decisions in the public utility area which have set rates of return in the general neighborhood of 8 percent—"well below the figures suggested by the railroads." GSA states its view as follows:

> It is our view that the same basic criteria governing the rates of return for public utilities should apply for the railroad industry, in view of the public-interest character of that industry. The Commission should take into account both the present *and historic* cost of debt; the return necessary to attract the capital at reasonable cost, and should seek to balance the interests of investors and those of the public in reaching its decision. These criteria, in our opinion, cannot justify promulgation of an optium rate of return for the railroad industry above the general range of 8%.

SHIPPERS

National Industrial Traffic League.—NITL is a nationwide organization of individuals, firms, and corporations engaged in the shipment and receipt of commodities, and of commercial, trade, and traffic organizations dealing with traffic or transportation matters. It is a voluntary organization whose object is the promotion of adequate national and international transportation. NITL is dedicated to the attainment and preservation of an adequate and efficient national transportation system, privately owned and operated, and to the protection of the shippers' interests in transportation problems. To NITL, the issues in this proceeding relating to rate base and rate of return, to the extent that such returns on investment are relevant in general rail revenue cases, involve issues of national transportation importance to the NITL and its members. NITL filed two separate statements, the latter incorporating the former by reference, hence, they will be treated as one for the purpose of the following summary.

Before beginning its broad statement of position, NITL makes the following observation:

> *** it is difficult at this phase to take even a general position without having some specific idea as to the significance of the end result. This is made even more difficult in this proceeding since the precise weight given by the Interstate Commerce Commission to any consideration of return on investment or return on rate base as a part of its exercise of administrative expertise in arriving at just and reasonable and non-discriminatory rate either (a) in general increase cases or (b) in specific rate cases, whether involving the rate of a single carrier, intermodal competition, etc., is not clearly apparent. It is certainly arguable that considerations of return on investment are and/or should be "irrelevant" in a determination by the Interstate Commerce Commission of a just and reasonable and otherwise lawful rate.
>
> It is the position of the National Industrial Traffic League that the consideration of return on investment by the Interstate Commerce Commission can be relevant but is not necessarily dominant, controlling, or the most significant factor to be considered by the Interstate Commerce Commission in arriving at a just and reasonable and otherwise lawful rate either in a general increase case or a case involving specific rates. To the extent that "return on investment" is to be considered relevant at all, it is appropriate that all parties understand the input that goes into both (a) the determination of the rate base and (b) the determination of the reasonable return or rate of return on that rate base. Hence, this proceeding is welcomed by the League.
>
> The League believes that what is presently included in "that investment" does not constitute an appropriate rate base for railroads but, in fact, substantially overstates such a rate base. Rate of return can only be determined after the rate base is established, and then the return must be determined in accordance with [the following] ***

Considering the definition of net investment base, NITL questions the application of the current definition—cash plus cost of materials and supplies, and investment in property used in transportation operations less depreciation. NITL believes that the term "original cost" is not adequately recognized in the present definition. NITL compares the original cost pipeline definition at 49 CFR 1260.5, with the lack of such a definition in the uniform system of accounts applicable to railroads, 49 CFR 1201. NITL believes that "nothing in the Commission's definition of railroad net investment or within its own regulations assures that 'original cost' will be preserved and protected as the maximum level of allowable 'investment'." NITL believes that both the development of original cost, as well as preserving its validity through subsequent transactions, is open to question. Such subsequent transactions give rise to the League's concern for the validity of the present net investment figures.

The following observations were made by NITL:

> The problem of the content, i.e., the figures contained within the "net investment" was recognized by the Commission in its decision in Ex Parte Nos. 265 and 267 when it went on to say at page 164:
>
> "Prior to 1963, the book figures of the carriers often included so-called historical cost which the Commission could not, and did not accept as a reliable base in general revenue cases. Instead, it used the 'original cost' of the transportation property reflected in the valuation records prescribed and maintained by the railroads and by the Commission pursuant to section 19a of the Act, less book depreciation, plus the estimated value of land and an allowance for working capital. In 1963, the Commission issued an order which required all railroads to adjust their corporate books and substitute the adequately supported cost of property figures shown in the valuation records in place of the rejected historical cost. *See Annual Report, 1964*, at page 54."
>
> The Commission's discussion of its accounting requirement entered in Docket No. 32153, as contained in the 78th Annual Report, 1964, pages 54-55, are attached ***. As pointed out by the Commission, the application of the provisions of its accounting Orders entered in 1963 resulted in the elimination from the primary accounts of the several classes of common carriers of substantial sums which were carried forward as part of so-called historical cost. Under the provisions of the Commission's Order, the excess of the total adjusted historical costs over cost shown in the valuation records (presumably imputed as or demonstrated to be the "original cost") was authorized to be written off to retained income (surplus).
>
> It appears from the same source, the Commission's 1964 Annual Report, that the aggregate costs in those valuation records which the Commission is now considering as based upon "original cost" were in fact not original costs but were, to some extent "based on reproduction cost", I.C.C. 78th Annual Report, 1964, page 55. [Footnote omitted.] At that point, the Commission did state that the "cost of reproduction computed in the manner followed in our primary valuation of railroads, compared with the original cost of construction, where ascertainable, has been found to be in general approximately the same.", citing 177 I.C.C. 450. At any event, there seems to be a concession that a reproduction cost, not an original cost is implicitly contained within the "cost to which the primary [ac]counts were to be adjusted."
>
> *Summary:* The "net investment" base is assumed to be premised upon "original cost". The accuracy of that assumption must be demonstrated. The accuracy of that assumption can only be demonstrated by tracing the adjustments to the "net investment base" caused or resulting from various transactions since the "original cost" was first established. It must further be demonstrated that those adjustments are consistent with the principles discussed below which must be honored to preserve the integrity of an original cost net investment base reflecting no more than actual value of consideration paid for, used and useful proper[ty], less accrued depreciation.

NITL's conditional acceptance of the net investment rate base concept is based on an application of net investment base including no more than (1) the original cost of transportation property; (2) prudently obtained or acquired property; (3) used and useful; (4) properly adjusted downward when transferred or acquired for values reflecting less than the depreciated original cost; (5) properly adjusted to reflect credit for gains on sales of former transportation properties; and (6) reflecting all accrued depreciation.

First, NITL advocates that original cost, less accrued depreciation to the first person or corporation dedicating such property to public use should be a ceiling on values used in a net investment rate base. Where an entire property or portion is acquired from another common carrier by purchase, merger, consolidation, or reorganization, the cost of the property to the vendee should be construed to be no greater than the original cost to the vendor of the property acquired, subject to decreases to reflect such elements as the prudent investment, and used and useful property limitations, and the actual value of consideration paid, among others. NITL would, in any event, require all previously accrued depreciation to be recorded and carried forward to subsequent asset holders. NITL maintains the Commission accounting regulations permit an acquiring carrier to record a property's value at the purchase price. No depreciation would be carried forward. NITL believes that the acquiring carrier would then commence to depreciate the property again on the new value as if it were brand new. The net result to the ratepayers is twofold: (1) substantially more than original cost less accrued depreciation is recorded in the carrier property accounts, and (2) previously paid depreciation expenses are lost and the ratepayer will commence paying new annual depreciation charges which are duplicative of previously paid depreciation expenses. NITL is not satisfied that such transactions are cleared through the Commission's Bureau of Accounts.

Second, NITL advocates that all property acquisitions permitted to be recorded as part of the rate base must be prudent investments properly related to the provision of transportation services. NITL argues that the ratepaying public should be obliged to pay only for a reasonable return on "prudent" property acquisitions or investments. Third, NITL avers that property should be included in the rate base only if it is demonstrably used and useful in the provision of actual transportation services. NITL is concerned with excess capacity in the railroad industry, as indicated in the ASTRO report. NITL believes that excess railroad properties should be eliminated from the net investment base.

Fourth, the original cost, in NITL's view, must be decreased whenever the transportation property is transferred to or acquired by a successor carrier for consideration less than depreciated original cost. NITL observes:

> There have been occasions, and there is reason to believe there may have been many such occasions, where transportation properties have been transferred from a predecessor to a successor carrier in exchange for a consideration that reflected total values, i.e. the value of the consideration, which were less than the depreciated net book value of the transportation property involved. The accounting treatment provided for such transfers does not appear to require a consistent and uniform adjustment to reflect the lesser value of the consideration paid for the property as well as a carrying forward of all previously accrued depreciation.

NITL claims that it can provide examples of carriers recording property values on their books in merger situations at less than book value. NITL states it should be the railroads obligation to prove that the net investment figures have been decreased when a carrier has paid less than the first carrier's book value for certain property. NITL does not believe that it is any answer to say that such transactions are recorded with either the explicit or implicit approval of the ICC. NITL alleges that the question is whether those amounts have been adjusted to reflect no more than true value of any consideration paid therefor, subject to a maximum of original cost less accrued depreciation.

Fifth, NITL claims that where there has been a disposition or transfer under any circumstances where a gain has been achieved over the net book value, then such gains must be imputed to the property accounts through an adjustment to depreciation. Sixth, NITL believes that deferred taxes should be deducted from net investment base. Funds from deferred taxes are capital that is not provided by investors. NITL believes that deferred taxes constitute tax-free and interest-free capital made available under the tax laws. Such capital in its view is not entitled to be considered in the rate base for the computation of a return on investment.

Seventh, NITL reemphasizes its view that all depreciation should be carried forward in both in property accounts and the depreciation accounts. To do otherwise, NITL states, would result in the ratepayer paying more than once for the use of carrier property. Eighth, and finally, NITL maintains that leased property is not properly included in a net investment base consisting of owned property.

Considering an allowance for working capital, NITL believes that cash plus the cost of materials and supplies recorded on the carriers' books do not, as such, constitute appropriate figures for inclusion in a net investment rate base, because such figures can and do fluctuate widely. NITL argues that a working capital allowance should be determined based on a timelag study—to find the necessary investment in materials and supplies plus cash required to pay operating expenses incurred for services rendered prior to the time when revenues for such services are available to the carriers. Such an allowance should be included in the rate base only to the extent that it is supplied by the investor. NITL states that accrued tax balances should be deducted from a working capital allowance computation since these are also noninvestor-supplied funds.

Turning to the question of rate of return, NITL alleges that, in general, a rate of return should provide over and above all "actual legitimate operating expenses" of furnishing adequate and efficient rail transportation, a return to cover interest charges or the cost of debt used as investment and transportation properties, i.e., the debt portion of the net investment rate base, plus a return to the owners which is (a) comparable to that of similar undertakings, (b) will insure the retention and attraction of capital, and (c) an amount adequate to foster the sound economic health and development of rail transportation sufficient to meet the needs of commerce and of the United States. NITL emphasizes that the computation of the rate of return is not in any sense to "be regarded as a guarantee that any individual carrier will earn a standard return in any given year or a period of years, or that the industry as a whole will achieve any specified rate of return in a particular period." NITL also offers the following observations:

> In determining a rate of return, it is appropriate to use the cost of capital technique which involves a separate determination of the cost of imbedded debt capital, the appropriate rate for equity capital determined by an inquiry into the investor earning requirements and earnings on investment in comparable enterprises, and the appropriate capital structure, or percentage of debt equity which should be

recognized in combining the cost of the two components into an overall rate of return. Capital structure is a critical factor in such a determination.***

The rate of return determination must be separately arrived at with respect to each individual carrier. There should be no group determinations of rate of return for either railroads nationally or by any regions. The rate of return is a separate and independent item to be determined with respect to each railroad individually.

General Mills group of shippers.[7]—The General Mills group of shippers purports to represent an extremely broad sprectrum of producing, manufacturing, and distribution activities, which contributed approximately $2.0 billion in 1971 to the railroads' gross freight revenues. As major users of the Nation's railroads, this group has a vital stake in the economic future of the railroad industry and regards this proceeding as an important step in identifying and remedying perhaps the railroads' most critical problems.

In its broad statement of position dated January 31, 1972, GMI alone made the following earnings policy recommendations:

(1) The Interstate Commerce Commission should pursue a more active and positive earnings policy to assure the promotion of safe, adequate, economical and efficient rail service and the fostering of sound economic conditions in the rail industry.

(2) The Interstate Commerce Commission should adopt a policy whereby railroads individually, or groups participating in a particular traffic, would present analyses and determination of their capital requirements. Such analyses and determinations should be specific as to investment objectives, service improvements, revenues and costs. They should be presented in terms of discounted cash-flows with costs of capital clearly set forth.

(3) The Interstate Commerce Commission should consider rate increases to encourage capital expenditures for projects for which discounted revenues would exceed discounted costs. The Commission subsequently should follow up on railroad performance to determine whether proposed expenditures were actually made and what results transpired.

(4) The Interstate Commerce Commission should limit General Rate Increase proceedings to revenue-operating cost relationships not including capital costs. Such proceedings should be separated from those involving the adequacy of earnings to attract new capital expenditures.

(5) The Interstate Commerce Commission should require railroad property to be amortized on a basis which would better equate book value to use of property and its economic worth. This may be done by changing required depreciation accruals from straight line to some other method, and by more carefully determining the extent to which rail property is actually used. Property, the replacement or abandonment of which in its best use by a railroad or railroads would increase discounted cash-flow, should be fully amortized. Property which in its best use would contribute to net-cash flow, but which is utilized in service in which there is a net cash deficit, should be removed from the earnings base; unless there is a Commission order that such service must be continued. This recommendation might be further facilitated by Commission adoption of depreciation accounting for obsolescence of road and structure.

---

[7] The General Mills group of shippers includes the American Paper Institute, American Retail Federation, Certain-Teed Products Corp., and Ford Motor Company.

General Mills alone indicates that it would attempt to provide evidence confirming the following "Assertions of Fact":

(1) The railroads in the last 15 years have experienced declining levels of earnings which have discouraged investment in the rail industry and caused outflows of funds which might have been economically reinvested.

(2) The operations of some rail segments would not produce positive net cash flows even if carried on with the newest and most efficient road, structure, and equipment.

(3) The railroads today possess, and in some cases utilize at very low levels, significant amounts of road, structure, and equipment, the replacement or abandonment of which would increase net cash-flow discounted even at relatively high rates. (10 percent being the discount rate used by the Federal Executive Branch in project appraisals. It is, in effect, a "social discount rate.")

(4) The present method of railroad earnings policy administered by the Intertate Commerce Commission, based on measuring rate-of-return on an established rate base, has not encouraged the flow of capital into the rail industry necessary to meet expanding service requirements and economic opportunities.

(5) The present exercise of earnings policy by the Interstate Commerce Commission over the aggregate property of the railroads does not have sufficient precision to encourage new investment and, at the same time, force the retirement of old.

(6) The expensing of depreciation and its accrual as a reserve according to the Interstate Commerce Commission accounting procedures are not realistic in economic terms, considering the effects of intermodal competition on property values. Basing depreciation of the physical results in book valuation of substantial amounts of property at values not justified by their economic contribution.

(7) Developments in ground transportation technology offer possibilities for a greatly increasing benefits of rail transportation to travelers and shippers.

General Mills (GMI) claims that it has proved its assertions of fact Nos. 1, 4, 5, and 6 through a study by witness Nelson. GMI has left Nos. 2, 3, and 7 for development by the railroads, the Commission, and the Department of Transportation, because the "underlying documentation is simply beyond the resources and capabilities of shippers to develop—because of the time allowed, the costs involved, and, perhaps most importantly, because such evidence is, or should be, within the power of the railroads, the Commission, and the DOT to develop on the record."

General Mills argues that the railroads face "extraordinarily difficult problems in attracting and retaining badly-needed investment for the new plant facilities that are needed if the railroads are to meet their common carrier obligation to their customers and the general public."

GMI further alleges that substantial changes in a number of Commission policies are required if the railroads are to remain a "viable economic institution under private management and ownership." GMI witness Nelson indicates that the financial difficulties of the railroads include: (1) a substantial net-outflow capital funds, (2) a declining earnings record, (3) general freight rate increases that have failed to improve earnings, and (4) a very limited availability of equity capital. For Nelson's study period, 1956-1970, the net outflow of capital funds from the railroad industry amounted to 53.2 percent of the railroads' available net income after Federal income taxes, or put another way, $11.5 billion. GMI believes that the major cause of this outflow of capital funds—in the form of dividends, interest, and debt payments—is the poor and declining earnings record of the railroads during the 1956-1970 period. Rail freight rates increased substantially during those 15 years, but the increases did not change the declining long-range earnings trend of the industry, or result in a higher level of railroad capital expenditures. GMI indicates that many railroads have had investor costs of equity capital amounting to 9 percent or more for which dividends were paid at yields about 50 percent higher than yields on nontransportation equity capital.

The results of the railroads' investment policies, in GMI's view, have brought about "substantial amounts of deferred maintenance in the property accounts, i.e., rails, ties, et cetera (which are not fully reflected in the railroads' annual reports because of questionable accounting treatment) and, in general, little improvement (some deterioration) of the quality of railroad services." GMI witness Nelson's evidence indicates that these trends cannot be reversed by conventional resort to further general freight rate increases. In short, GMI states:

> (1) Railroad General Freight Rates Increases are *not* meeting the industry's capital needs.
>
> (2) The heavy capital outflow from the railroad industry is rapidly dissipating shipper-furnished revenue. Stated in another way, shippers see their transportation dollars flowing in large amounts to the financial community, thereby foreclosing any hope for the improvement of the railroad industry's plant, productivity, or ability to render decent service.
>
> (3) This situation can only be described as intolerable and must cease if we are to retain any semblance of private enterprise in railroading and avoid nationalization in whatever form and degree that "remedy" might take.

GMI argues that the Commission must deal with these problems "as best it can." GMI recognizes that there are "practical, institutional, economic and legal constraints upon the Commission's ability to arrest the present decline in railroad earnings and the deterioration of the railroads' attractiveness to investors, 'but believes' that by leaping beyond the narrow confines of past traditions the Commission can undertake a range of positive steps to deal with these serious problems." GMI suggests that the Commission should seek additional legislative authority to deal with these problems, wherever necessary.

Turning to GMI's specific recommendations, GMI groups its recommendations into (1) policies to encourage growth in capital, cash flows, and earnings, (2) policies to encourage fair values, and (3) policies to encourage service-improving private investments. To improve earnings, GMI recommends that the Commission give systematic and detailed consideration to railroad capital needs, that the Commission no longer resolve considerations of cost of capital and rate of return in general freight rate increase proceedings, that the Commission neither discourage no restrict diversification, that the Commission give greater consideration to divisions, that the Commission consider capital improvements assistance by means of escrow funds, and that the Commission encourage specific rate proposals.

To encourage fair values in net investment base, GMI states that the Commission should review in depth its policy of "expensing" the cost of ballast, rails, and ties; that the Commission should review in depth its policy of straight-line depreciation; that the Commission should revise its policy regarding the accounting and ratemaking treatments of Federal income taxes; and that AMTRAK-related items be completely removed from freight ratemaking accounts. And, in considering service-improving private investments, GMI suggests that the Commission encourage investment by nonrailroad entities in railroad equipment and facilities.

GMI maintains that the Commission should secure information from the railroads and other sources on a continuing basis to permit an appraisal of the present and future railroad capital requirements, both as to quantity and the cost. GMI believes that such considerations should be independent of any rate increase proposal. GMI suggests that certain types of capital improvements are, perhaps, so specialized that such costs should be recovered in specific rate changes; on the other hand, improvements of a more general character should be distributed by increases throughout the rate structure. Essential to a capital needs study in GMI's view, are a Commission evaluation and finding (1) as to the manner and form of railroad capital formation through a future sources and application of funds statement; (2) the effect of specific rates in attracting new and more productive capacity into the railroad system and the elimination of unproductive and uneconomic capacity; (3) a determination on a regular basis of the productivity and efficiencies of railroad capital; and (4) the relationship of new industrial technology and innovations to (1)-(3).

GMI argues that the Commission should no longer resolve cost of capital and rate of return considerations in general freight increase proceedings. Such proceedings, in its view, are not appropriate for determining the capital requirements for the industry. A determination of these requirements should cover long-range planning by railroad management on the basis of reasonably foreseeable events. GMI recognizes that this recommendation would effect no changes in existing Commission policy since the Commission has generally recognized that its ex parte increases are based primarily on grounds other than rate of return on net investment. General rate increases in recent years have been based largely on the need for additional revenues to cover present and immediate operating expenses, rather than long-term capital requirements. There are, thus, two separate issues: the short-term need for immediate increases to pay unavoidable increases in the cost of operations, and second, the long-range needs to meet the financial capital requirements of the railroads over a period of years.

GMI recommends that the Commission neither discourage nor restrict diversification by the railroads into nonrailroad activities. GMI believes that if railroads were a part of larger diversified corporate systems, with prospects of stable or increased earnings, then increased capital investments should occur in railroad equipment and physical facilities. GMI believes that "a properly-structured diversified investment program would offer positive benefits to both the railroads and their users." Nevertheless, GMI believes that the Commission should avoid substituting its judgment for that of the carriers as to what constitutes sound capital investment. In GMI's view:

> Such an effort is not only inconsistent with the private character of the Nation's railroads, but further, will be largely an exercise in *** futility as long as investors have a free choice in deciding to invest in railroads or other enterprises. The Commission cannot stem the exercise of that choice by legal fiat.
>
> However, the Commission can, by positive steps, strengthen the earnings of the railroad industry so as to encourage the inflow and retention of capital funds in railroading. In our judgment, a well-conceived diversification program provides just such a positive approach.

GMI recommends that the Commission give greater consideration to divisions in its evaluation of rail industry revenue needs. GMI believes that it would be proper for the Commission to consider the reallocation of divisions between the railroads pursuant to section 15(6) of the Interstate Commerce Act. GMI believes that the limitations on the use of divisions for remedying financial weakness may well be the result of "an attitude by the Commission—that divisions are largely a matter of private contractual dispute." GMI claims that the poorer carriers need to be made better off and seems to criticize the Commission for not prescribing clear standards or guidelines for the divisionmaking process. GMI also encourages the Commission to explore the feasibility of making greater use of the provision dealing with pooling of revenues as contemplated by section 5(1) of the act.

GMI also recommends that the Commission consider capital improvements assistance by means of escrow funds. GMI believes that an escrow fund would be appropriate to prevent the use of funds granted for attracting new capital for other purposes. This concept was adopted in Ex Parte No. 305. However, GMI does not propose but strongly urges against, the imposition of detailed reporting requirements on railroad capital improvement plans and capital recommendations made by management to boards of directors. Additionally, GMI does not favor any Commission direction or control over rail management decisions governing the selection of capital projects. To GMI, the critical problem is: how to retain capital in the railroad industry. The escrow account concept is seen as useful to this goal. GMI expresses concern over the large net outflows of capital funds in the period 1956-70. Over half of this outflow was paid out as dividends "(at a high cost to shippers)" from general freight rate increases and "failure to improve service"; however, GMI objects to any Commission dividend control or involvement in the selection of railroad capital projects. GMI comments:

> But we ask that the Commission, at least, study what techniques might be implemented to give an "information base" recognition to the cause-and-effect relationships between the relatively large capital outflows in the railroad industry, railroad freight rate levels, and the productivity of the railroad industry. We believe such recognition would be applicable to future Commission evaluation of general freight rate levels proposed by the railroads for cost-of-capital, investment base, return-on-investment, or other debt/equity-funding relationships.

General Mills argues that specific rate proposals made by individual carriers or groups of carriers, "if treated less formalistically by the Commission, offer a far more beneficial way of enhancing the Commission's role in railroad capital needs" than through general freight rate increases. GMI believes "many of the most innovative rate proposals" made by the railroads "are subject to a searching and particularized inquiry, and are very often criticized, or objected to, or annulled on highly technical and legalistic grounds," citing *Grain by Rent-A-Train, IFA Territory to Gulf Ports,* 335 I.C.C. 111. GMI observes:

> There appear to be irreconcilable inconsistencies between:
>
> (1) the Commission's determination of "fair return on fair value," (2) the explicit requirements in Part I of the Act concerning the justness, reasonableness, and nondiscriminatory character of railroad rates, and (3) the realities of the market place. To the extent that basic economic limitations will not permit many railroads to stabilize or increase their earnings, even Commission approval for rate increases may not improve the railroads' earnings. This makes it even more important that railroad management be given latitute to curtail, limit, or withdraw from service those operations which simply cannot be made to reach an adequate level of earnings.

GMI also notes that there is an obvious nexus between rates and charges established by the railroads, earnings of the railroads, and the ability of the railroads to attract needed capital investment into the industry.

As part of an effort to encourage fair values, GMI believes that the Commission should begin to establish depreciation accounting for certain road and track accounts, and that it should review its straight-line depreciation policy. Specifically, GMI avers that retirement methods of accounting for the road and track should be replaced by depreciation accounting. GMI is concerned that the present accounting methods may tend to overstate the value of the railroad investment. GMI alleges that straight-line depreciation is not appropriate for property of an industry which has experienced a high degree of economic obsolescence. GMI advocates that the declining balance or sum of the years' digits methods would be more appropriate. GMI suggests that the net value of railroad property might be reduced by as much as $5 billion through the use of accelerated depreciation. GMI recognizes that such changes would have to be gradually phased in to avoid undue distortion of the railroads' reported income and earnings. The "issue must be faced, and the sooner the better," in GMI's view.

GMI recommends that the Commission revise its policy regarding the accounting and ratemaking treatments of Federal income taxes. GMI favors the deferred tax method, sometimes called the normalization method, rather than the flow-through method of accounting for Federal income taxes. GMI claims that the present flow-through policy "serves to deprive those railroads in a tax-paying position of some of the benefits which Congress appears to have intended as a stimulus to investments and the economy as a whole." GMI recognizes that the railroads use these incentives in preparing their tax returns, however, GMI maintains that the Commission's present policy does distort the rail carriers' "earnings posture as to revenue needs and other aspects of ratemaking. * * *" GMI states that the deferred tax method would "present a more meaningful and accurate picture of the true state of railroad earnings than is now available."

With the advent of the National Railroad Passenger Corporation (AMTRAK), GMI now postulates that the Commission should, for freight ratemaking purposes, require the railroads to segregate and ultimately remove from their accounts all facilities and expenses, including fixed charges, rents, and taxes, that are primarily or solely related to intercity passenger service.

GMI believes that the Commission should encourage investment by nonrailroad entities in railroad equipment and facilities. GMI suggests that relatively prosperous nonrailroad entities could make greater investments in capital facilities than the railroads. GMI's witness Nelson observes:

> A policy which would more rapidly lead to rail service improvements and dampen the need for rate increases would be to encourage strong industrial companies to invest in railroad equipment and facilities. Typically, such companies require rates-of-return on new capacity investments which are considerably less than 'single-minded railroads.' Railroad service improvement might increase substantially if industrial companies were permitted and encouraged to invest in railroad transportation facilities and equipment.

GMI claims that the flow of investment by shippers and other nonrailroad interests is presently being inhibited by "regulatory and other practices that produce *either* economically unrealistic results, example—the allowances for shipper and other privately-furnished freight cars, *or* else unclear and uncertain legal principles: as, for example, the *ad hoc* application of the Elkins Act to shipper-constructed physical facilities."

In concluding comments on ratemaking, GMI indicates its belief that "railroad ratemaking and its regulation by the Commission is the ultimate and critical factor for improving the prospects of railroad earnings." Funds to pay for operating expenses, fixed charges incurred in the past, and a sufficient return to secure additional sources of capital from the financial community must come from the users of the railroads' freight service, the shipping public—subject only to the possibility that the railroads might secure direct cash inputs from public sources or the railroads themselves are willing to dedicate nonrailroad income to common carrier functions. GMI recognizes that group methods of ratemaking will still continue and be highly significant because the railroads are a single system, even though the constitutent parts are variously owned and controlled. GMI believes that reallocating divisions and revenue pooling may be helpful devices for the weaker segments of the railroad industry. GMI reiterates its belief that general freight rate increases simply do not accomplish one of their objectives--that of rendering the railroads more attractive to private investment. Indeed, GMI argues "the opposite is happening: investors are taking the money flowing from shipper-paid rates and running away, hard and fast." GMI argues that the issue to be squarely faced in this proceeding is the fact that very high proportions of capital funds have been and will continue to be paid out by railroad companies so long as earnings prospects show a long-term decline and that this outflow will not be stemmed by a "continuing parade" of general rate increases.

GMI questions the fundamental usefulness of any alterations to rate base for ratemaking purposes, although it does believe the rate base proposals it has made would provide a more meaningful picture of the railroads' historical rate of return. GMI maintains that investors are fully aware of the general degree of obsolescence in railroad rate base and have taken this into account in their attitude toward investments in the railroad industry. Thus, GMI believes investors are not as likely to be so much concerned with various methods of accounting for rate base and rate of return as they are with basic earnings results which flow from railroad operations.

GMI claims that attempting to relate the railroad rate general level to some established target rate of return may simply prove to be an illusion. The basic problem, as viewed by GMI, is that railroad property, as a whole, has a very little prospect in the foreseeable future of generating increases in net income. GMI believes that the Commission cannot increase rates sufficiently to stabilize or increase the trend of earnings without rates becoming quite discriminatory. To GMI, there appears to be a "chronic and perhaps irreconcilable conflict" between the railroads' ability to earn a fair rate of return on total investment, however calculated, and basic regulatory requirements that specific rates and rate relationships be just and reasonable, and nondiscriminatory." The Commission's inability to raise rail revenues at will is largely because of intense competition from other modes of transportation.

Notwithstanding, GMI advances that this proceeding offers the Commission the opportunity to revitalize its regulatory policies with the objective of encouraging railroads to adopt innovations and improvements which will redound to the benefit of railroads, shippers and the public as a whole. GMI believes the alternatives are a bankrupt industry and the "morass of national control." GMI claims that its funds flow/economic analysis approach will show how rail industry profit and service to the public can be made more meaningful and be improved significantly.

APPENDIX D

REPLIES TO 1972 STATEMENTS OF POSITION AND VERIFIED STATEMENTS

Table of Contents

	Page
Railroads' reply	1708
Bill	1708
Hamilton	1709
Coyne	1709
Smith	1715
Reply of General Mills' group of shippers	1719
Nelson	1720
Waterways Freight Bureau/Water Transport Association	1721

Replies to 1972 statements of position and verified statements

RAILROADS' REPLY

The railroads' reply to the other parties' initial verified statements consists of a statement by Cyril M. Bill, a financial officer with the Southern Pacific; a statement by Robert S. Hamilton, a marketing officer with Southern Railway; a statement by Frank H. Coyne, a financial officer with the Burlington Northern; and a statement by Layton F. Smith, a partner with the Salomon Brothers investment banking house. Witness Bill's statement is directed to depreciation questions; witness Hamilton's statement is directed to the use of capital budgeting cutoff rates, and other capital investment selection techniques; witness Coyne's statement is directed primarily to that of the General Mills' group of shippers; and witness Smith's testimony is directed to the dividend and capital expenditures questions.

Bill.—Witness Bill's testimony is designed to support the railroads' position that reasonable charges are made for ordinary wear and tear under the retirement-replacement method of handling the roadway accounts and that such investment accounts now reflect an amount that compares closely with what net investment would have been under other accounting methods, such as the ratable depreciation method. In Bill's opinion, the retirement replacement method has the very real effect of not adequately reflecting the continuing impact of inflation on the investment accounts, since the original cost of the initial installation is reflected in the investment accounts, not the later inflated prices such as would be the case with capitalizable assets under the ratable depreciation method. Witness Bill's conclusion is based on a study submitted in response to the United States Treasury Department's request for data demonstrating the reasonableness of results under the retirement-replacement (plus betterment) method of accounting for track accounts. Treasury's request resulted in a massive statistical study made under witness Bill's direction for a committee of the Association of American Railroads and submitted to the Department in March 1967. The source of statistical data is "Statistics of Railways in the United States" published by the Commission, as well as the Commission's Valuation Reports, Schedule of Annual (Construction Costs) Indices for Carriers by Railroad, Elements of Value of Property Used in Common-Carrier Service, Records of Average Scrap Metal Prices, and annual reports of carriers to the Commission, among others. In addition, experienced railroad construction, maintenance and valuation engineers were consulted as to certain field procedures and facts for accurate analysis of the data. During 1967, the certified public accounting firm of Haskins & Sells was engaged jointly by the Treasury Department and the AAR to verify the study. Haskins & Sells rendered a report concurring in the method of study, the data used, the accuracy of the computation; and expressed the opinion that the retirement-replacement method has produced a reasonable allowance for exhaustion, wear and tear. Exhibits from this study as of 1963 (with minor adjustments from a tax basis to a book basis), plus an updating to 1970, were presented.

Bill believes that the study supports his conclusions that the railroads' net investment base is not overstated due to the absence of a depreciation reserve for certain roadway accounts. Bill claims that the investment balance for retirement-replacement type roadway property compares favorably with a net investment that might be the result of ratable depreciation accounting.

In responding to GMI's suggestion that accelerated methods be adopted for depreciating rail rolling stock, Bill comments, that even though this suggestion appears to have been made with the objective of reducing the net investment base for ratemaking purposes, one of the results would be to increase the reserve in the initial period and at the same time to give the equivalent of an increase in the allowable expense for ratemaking purposes. Bill also argues that the adoption of accelerated depreciation for financial and ratemaking purposes would run counter to the general practice of American industry, citing an American Institute of Certified Public Accountants survey of 600 companies in which it was found that the majority use straight line rather than accelerated methods of depreciation.[1]

Hamilton.—Witness Hamilton's statement is designed to show that certain capital budgeting cutoff rate generalizations made by GMI witness Nelson do not comport with the facts. Hamilton argues that such a cutoff rate is not necessarily ordinarily used in planning *all* capital expenditures, and, further, that such a cutoff rate is not necessarily fixed. Hamilton says that Southern's capital expenditure committee considers four categories of capital expenditures projects: (1) where safety or environmental matters are involved; (2) where the project is such that a rate of return on the proposed investment is not susceptible to calculation at all; (3) where the project is such that while economic return is apparent, Southern's means of measurement are such that such returns are not susceptible to postaudit confirmation, and the approval or disapproval must be based on other considerations; and (4) where the proposed investments are clearly susceptible to a rate of return analysis and measurements are reliable enough to allow postaudit of the results. Projects falling into category (4), according to witness Hamilton make up considerably less than half the projects considered. Projects in the first category require no economic analysis and are said to be invariably approved when the capital expenditure committee has been convinced that such projects are needed for safety or environmental protection. For Southern, projects in the second category are also often felt to be essential to maintain high standards for service and safety. No rate of return analysis is even attempted. Such decisions may be made strictly on policy grounds. On the other hand, projects in category 4 are readily susceptible to reliable economic analysis. Examples include the acquisition of labor-saving machinery and the replacement of old machines, including motive power and freight cars. Sometimes even here, however, decisions are made without regard to rate of return analysis where, for business reasons, it is felt that an investment would be wise, in order to provide service even though present rates may not be entirely favorable—such as new cars for pulpwood traffic whose existing rates were not regarded by Southern management as being adequate. Where Southern clearly has optional investments, it has no fixed thresholds for specific rates of return. Hamilton indicates that Southern does "shoot for 10 percent [rate of return] after taxes as the minimum." This is in an effort to deal in priorities. Sometimes, Southern indicates it will tolerate as a normal business risk an "uneconomic operation" where traffic is expected to grow or new traffic is generated.

In conclusion, in Hamilton's opinion, the railroads' approach to making an investment decision is not unlike that used by industry generally. Investment A may be necessary to continue to operate the business; investment B may be needed for anticipated traffic or volume growth; investment C may be totally optional for the enterprise and it is only as to category C that the acceptance of competing proposals would hinge largely on rate of return analysis.

Coyne.—In commenting on GMI's revenue pooling or escrow accounts remedy, Coyne argues that the basic railroad problem is inadequate earnings, and that these suggestions merely involve redistribution of an already substandard and inadequate level of earnings. Rail witness Coyne disagrees most strongly with GMI witness Nelson in several particulars. Coyne believes that there has not been a net outflow of capital funds from the industry as Nelson believes; there has, in Coyne's opinion, been a shift from external sources to internal sources of capital. Coyne believes that Nelson's $11.5 billion net outflow from the industry fails to include the internal sources of net railway operating income and depreciation or those funds generated from nonrail sources. For certain railroads, Coyne shows that nontransportation income is a considerable source of funds.

---

[1] Accounting Trends and Techniques, 1972 edition, AICPA, table 3-12, page 210.

Coyne's exhibit 1 is designed to show that rail investment in plant and equipment has a positive net inflow or increase of $8.0 billion during Dr. Nelson's 15-year study period. Considering net increases and decreases in capitalization, Coyne shows a positive net inflow of $1.0 billion into the railroad industry, shown as sales of $11.5 billion minus repayments of $10.5 billion. To Coyne, witness Nelson's testimony merely indicates that $11.5 billion shifted from reliance on externally generated funds. Using witness Nelson's own numbers, Coyne shows that the industry actually increased its investment over Nelson's 15-year period by some $8.0 billion; and comments:

> This most emphatically demonstrates that there is not an outflow of funds from the industry nor does there exist a flight of capital from the industry. There is, rather, a flow of capital to maintain the plant but it is inadequate. If the rate of return could be increased, probably more external capital could be attracted or more internal capital funds would be availble.

Coyne makes the following comment on dividends and interest, in response to GMI witness Nelson:

> *** Interest and dividends instead constitute payment or return for capital invested in the industry. Nonpayment of interest could lead to dire results as it represents a specific commitment. It could lead to a closing of capital sources, higher interest rates and possible bankruptcy. Nonpayment of dividends may or may not lead to higher capital costs, closing of capital markets, or falling stock market prices, and eventual management changes. Such possible results will not occur if the equity holder is convinced that the retained earnings will bring about adequate appreciation of his investment in terms of greater earning power of the railroad industry. Equity and debt capital are entitled to their "wages." Therefore, interest cannot be appropriated by management as a source of capital. Dividends can be considered as a source of money to be used for reinvestment under the proper circumstances, but payment of dividends cannot be regarded as a disinvestment or outflow from the railroad industry.

Coyne agrees with the general theory that shareholders are compensated for invested capital through dividends or through share price depreciation, or some combination of both. Table I illustrates that rail cash dividends as a percent of shareholders' equity are substantially below industrials.

TABLE I

Corporate dividends

1955-1971

Year (a)	Cash dividends declared, Class I railroads (Millions) (b)	Net corporate dividend payments			Cash dividends as percent of shareowners' equity	
		All industries (Millions) (c)	Manufacturing (Millions) (d)	Commun. & Pub. Util. a (Millions) (e)	Class I railroads (f)	Moody's industrials (g)
					Percent	*Percent*
1955 -----	$447	$10,478	$5,346	$1,708	2.7	7.8
1956 -----	432	11,280	5,752	1,863	2.6	8.3
1957 -----	427	11,742	6,008	1,999	2.5	7.9
1958 -----	372	11,566	5,581	2,153	2.2	7.2
1959 -----	403	12,580	5,945	2,403	2.3	7.0
1960 -----	385	13,437	6,265	2,503	2.2	6.9
1961 -----	358	13,770	6,086	2,771	2.1	6.7
1962 -----	368	15,183	7,185	2,902	2.1	6.9
1963 -----	379	16,454	7,574	3,198	2.1	7.1
1964 -----	457	17,811	8,451	3,355	2.6	7.4
1965 -----	471	19,808	9,389	3,610	2.7	7.6
1966 -----	499	20,797	10,090	3,927	2.8	7.7
1967 -----	503	21,385	10,215	4,111	2.8	7.3
1968 -----	516	23,552	11,375	4,407	2.9	7.0
1969 -----	487	24,331	11,123	4,597	2.7	7.1
1970 -----	421	24,795	10,157	4,859	2.4	6.7
1971 -----	386	25,425	9,452	5,255	2.3	p6.2
Percent over 1955 -----	d14	143	77	208	-----	-----

Note: Railroad dividends shown in column 1 include amounts paid to other railroads and are, therefore, overstated in relation to the net corporate dividends shown in columns 2, 3 and 4 which exclude payments to other corporations. About one-third of railroad stocks are owned by other railroads.

a—Communications plus electric, gas and sanitary services.

d—Decrease.

p—Preliminary.

SOURCE: Columns 1 and 5, Interstate Commerce Commission; columns 2, 3 and 4, U.S. Department of Commerce; column 6, Moody's "Industrial Manual".

Table II shows a total return to industrial stockholders of 9.21 percent annually, combining dividends and share price appreciation. The return to rail shareholders during the 1962-70 period is shown to be 6.84 percent annually. Thus, industrial shareholder yields are about 35 percent more than railroads. Therefore, railroads can be expected to maintain a higher cash dividend payout ratio.

TABLE II

Annual yield to shareholders industrials vs. railroads

Item (a)	Year 1970 (b)	 1962 (c)	Net change or cumulative dividends (d)	Net change as percent of 1962 share price (e)	Percent change per year (f)
				Percent	*Percent*
1. Industrials share price	$270.83	$189.95	$80.88	42.57	4.73
2. Dividends	------	------	76.62	40.34	4.48
3. Total	------	------	------	------	9.21
4. Railroads share price	65.61	63.39	2.22	3.50	0.38
5. Dividends	------	------	36.90	58.21	6.46
6. Total	------	------	------	------	6.81

From above table

	Annual yield to shareholders
7. Industrials	9.21
8. Railroads	6.84

Coyne maintains that, contrary to GMI witness Nelson's conclusion, no correlation exists between general freight rate increases and increasing outflows of capital funds (or cash) from the railroads, or conversely, a declining reliance on external fund sources. Coyne concludes that there is no basis in fact for Nelson's determination that rate increases lead primarily to larger outpourings of capital funds from the railroad industry.

Coyne claims that the limit on investments in railroad property is governed more by the availability of capital rather than by a theoretical cutoff return on investment. On this matter, Coyne duplicates the beliefs of witness Hamilton. Considering GMI's contention that dividends should, in greater measure, have been reinvested in plant investment, Coyne believes that it is not possible at this time to conclude that investment of the equity holders' dividends would have made the rail industry perform financially any better over Nelson's 15-year study period. Coyne demonstrates that if the yearly dividends and associated earnings flow over the 15-year period, 1956-70, had been reinvested in railroad property on a theoretical annual experienced rate of return basis and reinvested funds depreciated annually at 2.5 percent, which assumes an average life of 40 years, virtually no change would have occurred. Also, Coyne made a theoretical calculation on the same basis, except the reinvestment is made at 13 percent. See table III below.

TABLE III

Comparison of industry actual rate of return with a theoretical computation of reinvestment of dividends and added earning resulting from reinvestment

CLASS I RAILROADS

Year (a)	Actual (b)	Reinvestment of dividends: At historical rate of return (c)	Reinvestment of dividends: At theoretical 13 percent rate of return (d)
	Percent	*Percent*	*Percent*
1956	3.95	3.92	4.08
1957	3.36	3.33	3.67
1958	2.76	2.77	3.32
1959	2.72	2.73	3.45
1960	2.13	2.13	3.09
1961	1.97	1.98	3.16
1962	2.74	2.80	4.13
1963	3.12	3.13	4.59
1964	3.16	3.15	4.77
1965	3.69	3.66	5.36
1966	3.90	3.84	5.63
1967	2.46	2.44	4.70
1968	2.44	2.45	4.92
1969	2.36	2.35	5.03
1970	1.73	1.72	4.74

Column (b)—Net railway operating income divided by the net investment in transportation property, including cash and material inventories.

Column (c)—Net railway operating income increased each year to reflect earnings on dividends reinvested annually at each year's actual rate of return shown in column (b). Additional earnings on the earnings flow from reinvestment have also been assumed as reinvested. All earnings reinvested are added to investment base and are depreciated at 2.5 percent annually.

Column (d)—Computed in the same way as column (c) with the exception that dividends and earnings reinvested at an assumed rate of return of 13 percent.

In considering whether general revenue increases are necessary to offset increased costs, Coyne emphasizes that general revenue increase proceedings are "essential to the rail industry as a practical and feasible means for obtaining expeditious relief from recurring and persistent increases in costs. * * *" Without the ex parte increases, Coyne maintains that there would have been a "disastrous effect" on the railroad industry. For 1970 and 1971, the freight rate increases were seen as "absolutely essential and vital to the financial well-being of the carriers." Freight revenues in 1971 rose 7.9 percent over 1970, while operating expenses (including rents and taxes) rose to record proportions, up 4.2 percent 1970 over 1971.

Coyne is critical of GMI witness Nelson's thesis that there is a net capital outflow from the railroad industry and believes that such thesis is in error due to Nelson's failure to consider all inflow sources. The increase in capital expenditures and increased capitalization has resulted from greater reliance on internal sources of funds rather than the external. Coyne argues that returns to stockholders have not been excessive and that such returns are substandard when comparing combined dividend and share price appreciation of rail shareholders to industrial shareholders. Cash dividends represent only a part of a total equity return. Coyne further claims that there is no relationship between general revenue increases and flow of funds to external sources.

Turning to witness Nelson's 11 recommendations, Coyne believes that it is not unreasonable for the Commission to, on a continuing basis, secure information from the railroads and other sources on present and future railroad capital requirements, both as to quantity and cost. The ASTRO report is, of course, the railroads' estimate of capital requirements and revenue needs. Coyne urges that all parties concerned realize the existence of a substandard earnings level, a concomitant low rate of return and its effect on investment. Coyne maintains that regular increment analysis of rail capital financial productivity is the responsibility of railroad management. To this end, rail management has been making efforts to abandon the parts of rail plant which have become marginal, or if the service is to be required by the public, then the carrier should be adequately reimbursed, including a fair rate of return.

Coyne claims that GMI's two rate proceeding suggestions (one to cover cost increases and the second to cover rate of return) seems impractical. Establishing such a dual proceeding would increase the rate case expense and workload for all concerned. The implied suggestion that railroads can, at the second stage, simply raise rates at will for the purpose of securing capital improvement funds simply ignores the competitive realities facing railroads.

Commenting on GMI's diversification views, Coyne notes that, even though the railroads would all probably agree about investment in nontransportation activities and possibly other modes of transportation, the earnings of rail operations must be adequate to support increased capital investment in railroad operations. Nontransportation income has helped make it possible for the railroads to make many rail-related investments. Coyne is critical of GMI's inference that rail management is incapable of supervising railroad investments. It seems anomalous that GMI supports diversification and is willing to allow rail management to exercise its judgment in handling nonrailroad investments, but not rail-related investments. GMI seems to recognize that the Commission should not be a rail "super manager." Such an idea rests on a premise inconsistent with the private character of the Nation's railroads and would be an "infringement upon the investor's free choice of deciding where to invest his money." Coyne believes this reasoning is sound and equally applicable to rail, as well as nonrail investment. Diversification may well stabilize total earnings, but it would be "inequitable" to require such earnings to subsidize rail operations.

Considering GMI's divisions and pooling suggestions, all railroads agree that the divisions recommendations are not germane to the issues in this proceeding. Pooling is impractical because the railroads are a group of individual companies each with varying capital needs, problems and traffic patterns. To create a capital improvements fund pool through a general rate increase contemplates an additional decisional process, with additional potential delay. The Commission should recognize the basic public interest in an adequate transportation system which, in the rails' view, can only be obtained if the railroads are "permitted" to earn an adequate return on their investment.

The railroads are opposed to capital improvements assistance by means of escrow funds, as suggested by GMI. In the railroads view, before dealing with the distribution of capital, it is necessary to obtain adequate earnings to generate capital. The escrow funding remedies suggested are beyond this proceeding and premature. The railroads point out that capital needs and priorities differ greatly from railroad to railroad and that a standardized capital investment pattern for each railroad may be "economically imprudent."

Considering the question of possible dividends restrictions, Coyne argues that there must first be an adequate earnings flow to justify such investment. Forced retention of dividends would not automatically be translated into larger reinvestments in plant and equipment. Coyne also makes the following observation:

> Capital fund sources certainly would view restrictions on return for equity capital use as a reduction in the safety factor of monies loaned and they would require a higher interest rate on the ground that the lender may be the next supplier of capital to be cut off from his wages *for* capital. Exploration of methods for increasing capital availability to the railroads must rest on adequate earnings to justify the investments. The past fifteen years the industry has increased the net investment and experienced a decline in the rates of return on such investments.

Considering the contention that the rail net investment base is "substantially overstated" due to elimination of passenger facilities, Coyne notes that, since Amtrak was established, the industry has already claimed a $400 million writeoff. Coyne believes that rail investment accounts are not overstated and that any contention otherwise is simply "contrary to the facts."

Coyne states that GAAP accounting regulations do not follow the so-called flow-through method of treating Federal income taxes. The flow-through method results in a higher net income which immediately negates higher revenue needs, thus giving the users of rail service, rather than the carriers, the benefits of tax incentives. Coyne favors any type of tax "normalization" (sometimes called the deferred tax method) over a period of years, in lieu of flow-through.

In conclusion, Coyne makes the following overall observation on the GMI statement:

> In summary, the remedies as set forth in the GMI statement are beyond the scope of this proceeding, are premature, and fail to come to grips with the root problem of adequate revenues and earnings. Certain remedies have been advanced in the past, and afford no solution to the present revenue problem. The central hard-core industry problem of obtaining adequate revenues for essential capital improvements and maintenance of credit standing remains.
>
> The propriety of the railroads' net investment base has been before the Commission on numerous occasions. It has been found to be, and is, fairly representative and accurate as a base upon which to calculate the railroads' rate of return. The Commission should so find in the present proceeding. Similarly, the rate of return of the railroads on the present net investment base has been found substandard and inadequate. In my opinion, the rate of return of the industry remains substandard and inadequate at the present time. The Commission's efforts should be directed to effecting necessary changes in public policy designed to improve carrier earnings.

Smith.—Rail witness Smith is a partner with the Salomon Brothers investment banking house. Salomon Brothers regularly bids on rail equipment trust issues and is a leading market-maker among the few investment banking firms which actively trade railroad bonds and equipment trust certificates. Smith's statement is limited to two subjects, dividends and the level of capital expenditures by class I railroads. Smith views any possible comments that he might make on rate base and rate of return as "largely superfluous and redundant in view of opinions which have already been expressed by other parties."

From the investment community's view, the fundamental points which investors recognize about the rail industry are the cyclical nature of railway net income, heavy reliance on income from nonrail sources, and escalating operating and interest costs which are not matched by rate increases. Smith believes that on an industry basis there is an absence of any positive trend in earnings stimulating share price appreciation, which, in turn, confirms his belief that stockholders must look mainly to current cash dividend payouts, rather than share appreciation as the basic source of their return.

TABLE IV

Net railway operating income and other nonrailway income

($00,000 omitted)

Year	Net railway operating income	Other non-railway income	Total income	Other as a percent of total
				Percent
1971	$695.5	$422.5	$1,118.0	37.8
1970	485.8	482.4	968.2	49.8
1969	654.7	505.2	1,159.9	43.5
1968	677.6	499.6	1,177.2	42.4
1967	676.4	457.5	1,133.9	40.3
1966	1,045.9	399.5	1,445.4	27.6
1965	961.5	365.4	1,326.9	27.5
1964	818.2	368.9	1,187.1	31.1
1963	805.6	330.1	1,135.7	29.1
1962	725.7	325.6	1,051.3	31.0

Source: Association of American Railroads.

As shown in table IV, above, nonrail income is a critical income source to the railroads during the last 10 years. Nonrail income has increased by 30 percent to $422.5 million in 1971. If nonrail income had not been available, in 1970 the industry would have reported a $283.9 million deficit, rather than $76.2 million profit (after extraordinary items); and a $617.4 million loss in 1971 instead of the $336.1 million deficit (after extraordinary items) reported. Putting it another way, Smith calculates that the industry would have needed in excess of a 3.7-percent increase in freight rates, over and above those granted by the Commission to generate an amount of revenues equal to the income from nonrail sources.

A 34.4-percent increase in operating revenues was offset by a 35.5-percent increase in operating expenses. Wage expenses, including health and welfare benefits and payroll taxes, increased 30.5 percent over the same period. Annual employee compensation increased some 62.6 percent, partially offset by the large employee reduction of 155,000 persons or 22.2 percent since 1962 as shown in table V below.

TABLE V

Employees and their compensation class I railroads

Year	Total labor expenses ($00,000 omitted)[1]	Annual compensation per employee	Number of employees (00 omitted)
1971	$6,488.4	$10,827	544.5
1970	6,249.7	9,813	566.3
1969	5,841.1	9,274	578.3
1968	5,582.7	8,654	590.5
1967	5,344.7	8,085	610.2
1966	5,258.1	7,734	630.9
1965	5,121.5	7,490	639.9
1964	5,027.2	7,064	665.0
1963	4,904.5	6,808	680.0
1962	4,972.1	6,559	700.1

[1] Includes salaries and wages, health and welfare benefits, and payroll taxes.

Source: Association of American Railroads.

Given past cost and revenue trends, prospects for a major earnings improvement must be viewed as "dim and hardly attractive" to equity investors seeking any degree of share appreciation, in Smith's view.

In considering an apparent contention by witness Nelson that class I railroads have been "extravagant" in the net income percentage paid out in cash dividends to stockholders, Smith turns to a financial review of two railroad groups to ascertain whether the dividend pay out ratio is unduly high.

In 1971, 15 of the 71 class I railroads (21 percent) accounted for 91.3 percent of the dividends paid to shareholders. Moreover, the dividends paid represent only 53.9 percent of net income before extraordinary items. See table VI below.

TABLE VI

Data on 15 dividend paying class I railroads
($00,000 omitted)

1971

	Dividends	Capital expenditures	Revenues	Net income[1]
C&O/B&O	$26.0	$64.4	$950.0	$34.6
Norfolk and Western	49.4	81.2	727.0	77.7
Pittsburgh & Lake Erie	5.3	10.3	36.0	10.3
	80.7	155.9	1,713.0	122.6

See footnote at end of table.

Data on 15 dividend paying class I railroads—Continued
($00,000 omitted)

1967—Continued

	Dividends	Capital expenditures	Revenues	Net income[1]
Illinois Central	$11.1	$43.1	$352.0	$25.8
Louisville and Nashville	13.2	75.8	443.0	16.7
Seaboard Coast Line	26.9	81.1	530.0	41.2
Southern Railway	27.7	128.3	423.0	58.7
	78.9	328.3	1,748.0	142.4
Atchison, Topeka & Santa Fe	38.0	89.1	779.0	78.4
Burlington Northern	20.6	67.4	940.0	30.9
Denver & Rio Grande Western	8.6	13.2	109.0	15.5
Missouri Pacific	9.5	37.4	421.0	16.3
St. Louis-San Francisco	6.2	33.9	212.0	13.2
St. Louis-Southwestern	9.6	27.1	143.0	34.0
Southern Pacific	52.9	100.4	1,028.0	92.9
Union Pacific	47.9	124.9	691.0	108.2
	193.3	493.4	4,323.0	389.4
15 railroads—Total	352.9	977.6	7,784.0	654.4
Industry—Total	386.6	1,177.6	12,689.0	347.2
15 railroads as percent of industry	91.3	83.0	61.3	188.5

[1] Before extraordinary items.

Source: Association of American Railroads.

The net income of the dividend-paying 15 totaled $654.4 million and dividends amount to $352.9 million. By contrast in 1971, the entire class I group shows a net income of only $347.2 million, indicating an aggregate net loss for the remaining 56 railroads of approximately $307 million, while stockholders dividends have been $386.6 million.

In table VII, below, Smith compares 1971 capital expenditures of the dividend-paying 15, as compared with the other class I railroads.

TABLE VII

($00,000 omitted)

1971

	Net income	Capital expenditures	Dividends
15 Dividend-paying railroads	$654.4	$977.5	$352.9
Other class I railroads	(307.2)	200.1	33.7
	347.2	1,177.6	386.6

Source: Exhibit I.

Witness Smith concludes that the 15 railroads paying 91.3 percent of the 1971 dividends also accounted for 83 percent of capital expenditures. The other class I railroads were only able to finance $200 million of capital expenditures as compared with $33.7 million in dividends (which were largely paid on preferred stock) despite a loss exceeding $300 million. Thus, Smith concludes, the reason the industry's dividend payout is so high is because there is such a wide gap between profitable and unprofitable railroads. In Smith's opinion, the dividend policy of the profitable railroads has "indeed been prudent." Smith observes that there have been more dividend decreases or temporary eliminations than actual increases, which he attributes to changes in net income. On balance, however, Smith views the "absolute payout among the profitable railroads as being generally stable and the payout ratio to be in line with investor expectations."

Smith evaluated the same data for the 1961-71 decade which GMI witness Nelson presented. Smith's purpose in restructuring Nelson's cash flow data is to more clearly emphasize the relationships between the principal sources and use of funds. Smith believes that interest and other fixed charges are more properly classified as an expense, or one further railroad cost of doing business, rather than being grouped with debt retirement and dividends, neither of which are part of the body of a conventional income statement. Table IV abstracts the relationship which Smith perceives as being the most relevant in the above exhibit.

The measurement of capital expenditures against depreciation is one typically used in financial and credit analysis as a means of measuring the extent to which new facilities and equipment are being added to replace those being depreciated and/or written off. To Smith, it is unmistakeably clear that the railroads have consistently expended substantially more for new facilities and equipment than they have depreciated for book purposes. Smith claims that capital expenditures should be added to the cost of leased equipment and facilities. Smith endorses AAR estimates of leased locomotives and freight cars, 1961-71, as $2.4 billion. Thus, total capital expenditures, including leased equipment and facilities, 1961-71, should properly be considered as $16.7 billion, some 17-percent higher than the total capital expenditure level commonly recognized.

Considering debt ratings, Smith believes that (1) a balanced capitalization, and (2) an adequate fixed charge coverage ratio are principal factors in determining debt ratings. Railroads with a demonstrated ability to retire indebtedness in a timely manner enjoy, in Smith's opinion, "very favorable ratings on the debt issues which they offer." There is a direct relationship between the rating and the cost of money, or the interest rate charged. Smith believes that dividends are one of several indicators of the financial integrity and future prospects of any company.

REPLY OF GENERAL MILLS' GROUP OF SHIPPERS

In its reply to the other parties' initial verified statements, the General Mills group of shippers[2] repeats its fundamental position and makes the following additional points. In commenting on rate base and the general inflation issue, General Mills agrees that the problem of inflation is a "very real one," which should not be solved by the replacement cost rate base method suggested by the Waterways Freight Bureau. General Mills does not seem entirely comfortable with the railroads' suggestion that a more realistic rate of return be used as an adjustment for inflation, because it generally feels traditional rate of return approaches can only be mandated in the railroad industry in public-utility fashion "within very narrow limits." GMI advocates that attention should be given to other, more discriminating approaches that will tie specific rates or rate structures to current capital costs (including an element for replacement) of providing particular services. In any event, GMI avers that better information, other than generalizations, should be forthcoming from the railroads as to their capital needs, particularly with attention to what benefits shippers may expect from such investments.

---

[2] The General Mills group of shippers is frequently referred to herein as simply General Mills or GMI, for convenience.

Considering the issue of possible writedowns, GMI reiterates its belief that there should be no broad requirement that railroad property "without earnings value" be identified and expressly purged from the net investment base, as suggested by GSA and NITL, among others. GMI is inclined to agree with the railroads that such an approach is contradictory as to those assets not physically removed from service.

Considering the rate of return, GMI strongly cautions "against the uncritical use of techniques that may be suitable for monopolistic public utilities but may not be for railroads operating in a real-world setting where competitive, political and other factors are beyond the power of the railroads and the Commission to control." In response to rail witness Foster's 10-percent rate of return recommendation, GMI comments as follows:

> While we have no real difficulty with the analysis that leads to a 10-percent figure, we are somewhat hesitant in accepting it without considerably more data and analysis than the railroads have thus far furnished as to their capital requirements and other long-run financial needs, and the rate levels necessary to support a reasonable rate-of-return, whether it be 10 percent or any other rate.

Commenting on diversification, GMI responds to GSA's broad-based criticism of diversification by arguing that, while mandatory assignment of nonrail income to rail income might reduce the upward pressure on the rate level, the Commission's adoption of a "hard rule in this regard might in the long run be more harmful than beneficial to the public and the railroads." Such a course of action might "further impair investor confidence in the railroad industry and further encourage the out-migration of carrier funds."

In carrying out GMI's fundamental goals of (1) according fair treatment to investors in the railroad industry, and (2) in encouraging "economically justified" new capital investment, GMI reiterates its position that the rate of return rate base formula is only a part, and only a part with a very limited significance, in considering the railroads' financial condition. GMI advances that the Commission should consider the financial needs of the railroads in the "widest possible context." To this end, GMI recommends that its proposed changes in Commission depreciation and income tax accounting policies be adopted, that shipper investment in rail facilities be encouraged, that consideration of divisions and other rail ratemaking changes take place, and that the Commission exhibit flexibility in its attitude toward diversification by railroads into nonrailroad activities.

Nelson, in responding to rail witnesses Behling and GMI witness Foster, notes all agree that the important need is for a substantial improvement in the substandard rail rate of return, so that railroads may be enabled to generate, attract, and support the large and continuing investment funds that the industry requires, in order to provide adequate transportation service for the future. Nelson holds the opinion that such a goal should be the primary focus of any ICC earnings policy:

> From the viewpoint of the financial management of a company, interest, dividends and maturity payments are all costs of obtaining and holding capital funds. There is

> nothing in this or my previous statement to imply that railroad management improperly responds to the demands of share owners and capital funds markets by paying a net outflow [of cash, through dividends to investors.]

Nelson maintains that Foster's proposed overall rate of return is far higher than needed to meet the objective of a fair earnings policy. Nelson reiterates that earnings stability would have been achieved with $2.1 billion in additional 1956-70 earnings, while Foster's 10 percent rate of return would have required $14.6 billion in additional earnings for the same time period.

Nelson does not take serious issue with rail witness Foster's finding that 14 percent approximates investors' equity cost of capital for railroads, or that investors' total cost of capital is in the neighborhood of 10 percent. Nelson found an approximate 9-percent equity cost of capital for the eight major railroads for the 1956-70 study period. Taking into consideration the weaker class I railroad companies, a simple average of the equity cost of capital might be as high as 14 percent, in Nelson's opinion. Nelson is concerned that setting such an average equity cost of capital is likely to be far higher than that needed for the stronger rails, but much lower than for the weaker rails, and that a potential bonanza for some railroads would be created, while originating little additional capital to the financially weak rails. Nelson claims, then, that "the objective of earnings regulation would be defeated."

WATERWAYS FREIGHT BUREAU/WATER TRANSPORT ASSOCIATION

The WFB/WTA (hereinafter WFB) offers its views through Jesse J. Friedman, an economic consultant. The water interests are concerned that broad principles established in this proceeding may well have important implications for other regulated modes of transportation. To WFB, it is extremely important for any regulatory agency to "know what its revenue and profit objectives are." Such objectives in WFB's view, provide a tangible, meaningful yardstick for measuring the financial health of surface transportation. Friedman offers the following general comment:

> While the Commission's determination of a proper rate of return on investment, and of a proper investment base on which to compute the return, cannot in itself assure an adequate level of revenues and earnings to railroads or to any other segment of surface transportation, such a determination is tantamount to a determination of the revenue and earnings requirement which must be met if the policy objectives of the Interstate Commerce Act are themselves to be met. It is difficult to conceive of a more basic regulatory task of this Commission than the establishment of the level of revenues and earnings required for the economic soundness of the carriers being regulated.

The water interests' main concern is that original cost is presently being used as the basic principle for net investment base rather than reproduction cost which it favors. Friedman observes:

> *** it needs to be emphasized in the strongest possible terms that there is nothing sacred about original cost as a basis of valuing investment. My initial statement has developed at length the increasing uneasiness of the accounting profession and business executives, here and abroad, with a rigid attachment to original-cost concepts, because such rigidity, in the face of sustained advances in the prices of

> capital goods over the past few decades and the outlook for continued price inflation indefinitely ahead, is producing seriously misleading indications of investment and profitability. This is particularly serious in the case of capital-intensive industries, and one of the outstanding economic characteristics of both rail and water transportation is their intensive capital investment in relation to revenues.

WFB notes an anomaly that when shippers happen to own rail rolling stock such shippers are entitled to, and receive, compensation from the railroads for equipment ownership costs, called allowances. The Commission has determined that to constitute proper compensation for tank car ownership costs, for example, such costs should be based upon replacement value of equipment to give proper recognition to the impact of inflation, citing *Tank Car Allowances, Southern Ry. System*, 329 I.C.C. 466, 481 (1967). WFB sees little real difference between allowing replacement values for shipper-owned equipment, on the one hand, and a proposal to allow replacement values on rail-owned equipment in the railroads' net investment base, on the other. The WFB views the railroads' position as "excessively timid." The WFB believes that merly "jiggling the rate of return" is not a sufficient solution to the inflation problem and that replacement costs are a better alternative. WFB believes that development of price indexes (with due allowance for gains in capital productivity) for broad classes of equipment would not present any "inordinate statistical difficulties." WFB recognizes that there would be more challenging complexities in revaluing facilities rather than equipment.

WFB criticizes DOT's ambitious approach involving projected funds flow analysis together with productivity analysis as "simply too rudimentary and its proposed application too unclear, to support the central weight which DOT urges the Commission to place upon it, in determining the 'economically justifiable costs which need to be recovered through a general freight rate increase' in revenue-level proceedings." WFB makes the following additional comment:

> Under the DOT proposal, the Commission would be required to review, or itself perform, a series of econometric exercises relating both to past trends and projected future trends of various factors. Many of the projections would necessarily involve such a large margin of error as to negate the validity of the results for the use intended. Section III of the DOT statement, which purports to demonstrate how the various elements of the proposed data can be used "to estimate future revenue needs," reveals all too clearly the fuzziness and general unreadiness of the idea in its present form.***
>
> In essence, then, DOT has provided a suggestive list of data and ratios which have a general bearing upon revenue need determinations, but has not presented a proposal which at this stage can be seriously evaluated, much less adopted by the Commission.***
>
> In sum, the DOT approach, for all of its laudable intentions, does not, as now presented, provide a useful guideline for the Commission to follow in this case.

APPENDIX E

Imputed equity interest: four railroads

	Erie Lackawanna	Rock Island	Union Pacific	Southern Railway
1. Construction work in progress (Dec. 31, 1973)	$184,000	$1,731,000	$27,555,000	$2,907,000
2. Estimate of proportion of construction work financed with debt—(percent)	25	25	25	25
3. Estimate of debt financing of construction (line 1 x line 2)	$46,000	$432,750	$6,888,750	$726,750
4. Interest during construction (estimated interest rate of 8 percent applied to line 3)	$3,680	$34,620	$551,100	$58,140
5. Alternate-interest during construction (interest rate of 8 percent applied to line 1)	$14,720	$138,480	$2,204,400	$232,560
6. Additional credit to earnings (line 5 - line 4)	$11,040	$103,860	$1,653,300	$147,420
7. 1973 net income (loss)	$(18,572,000)	$(14,980,000)	$125,724,000	$66,313,000
8. Adjusted net income (loss) (line 6 + line 7)	$(18,560,960)	$(14,876,140)	$127,377,300	$66,487,420
9. Additional earnings (line 6) as percent of net income (loss) (line 7)	0.059	0.693	1.315	0.263
10. 1973 dividend payout ratio—(percent)			42.3	46.0
11. Dividend portion of additional earnings (line 10 x line 6)			$699,346	$80,233
12. Cash plus temporary investments (Dec. 31, 1973)			$22,603,000	$40,492,000
13. Additional dividends (line 11) as percent of liquid assets (line 12)			3.1	0.2

APPENDIX F

INTERSTATE COMMERCE COMMISSION

Class I line-haul railroads selected earnings data
(000 omitted)

District, railroad and year		Quarter ended September 30					Twelve months ended September 30					
		Railway operating revenues	Net railway operating income[1]	Ordinary income[2]	Net income[3]	Net ton-miles of freight	Railway operating revenues	Net operating income[1]	Ordinary income[2]	Net income[3]	Net ton-miles of freight	Return on net investments[4]
												Percent
Eastern district	1975	$1,415,960	$(22,114)	$(27,954)	$(27,445)	51,718,751	$5,764,591	$(264,004)	$(264,892)	$(267,998)	222,782,966	-0-
Do	1974	1,573,449	57,590	43,786	46,254	64,139,138	5,822,799	138,684	(45,505)	(8,192)	257,369,142	1.39
Southern district	1975	685,742	61,041	39,646	39,646	34,592,381	2,757,857	203,008	198,755	211,073	144,113,633	3.98
Do	1974	740,175	58,718	62,258	62,258	40,038,844	2,858,173	310,137	250,273	250,273	164,749,652	6.38
Western district	1975	2,060,456	151,912	135,909	140,167	103,759,333	7,793,833	284,649	233,501	237,207	405,668,561	2.07
Do	1974	2,085,840	139,153	140,820	140,920	112,622,799	7,872,599	601,669	593,115	601,638	461,940,221	4.90
Total all districts	1975	4,162,158	190,839	147,601	152,368	190,070,465	16,316,281	223,653	167,364	180,282	772,565,160	0.77
Do	1974	4,399,464	255,461	264,864	249,332	216,800,781	16,553,571	1,050,490	797,883	843,719	884,059,015	3.88
National Railroad Passenger Corp	1975	69,712	(82,059)	(88,019)	(88,019)	—	246,247	(314,311)	(334,734)	(334,734)	—	-0-
Do	1974	69,924	(61,848)	(66,633)	(66,633)	—	199,019	(172,714)	(184,750)	(184,750)	—	-0-
Total all class I line-haul RR's	1975	4,231,870	108,780	59,582	64,349	190,070,465	16,562,528	(90,658)	(167,370)	(154,452)	772,565,160	-0-
Do	1974	4,469,388	193,613	198,231	182,699	216,800,781	16,752,590	877,776	613,133	658,969	884,059,015	3.03
Individual railroad data												
Eastern district												
Akron, Canton, & Youngstown	1975	1,887	(169)	(248)	(248)	37,291	7,996	490	148	148	162,299	2.94
Do	1974	2,606	352	279	279	60,480	9,148	1,315	1,059	1,059	218,240	7.68
Ann Arbor	1975	2,186	(968)	(1,238)	(1,238)	67,134	8,611	(4,709)	(5,692)	(5,692)	429,030	-0-
Do	1974	2,750	(398)	(655)	(655)	107,131	9,277	(3,267)	(4,323)	(4,323)	516,449	-0-
Baltimore & Ohio	1975	147,622	2,965	1,888	1,888	6,299,958	614,701	23,944	28,733	28,733	25,587,972	2.53
Do	1974	174,899	24,484	24,293	24,293	8,276,161	632,192	65,411	47,351	55,515	32,622,480	6.79
Bangor & Aroostook	1975	3,445	170	3	3	97,540	14,841	1,480	734	1,216	436,100	2.64
Do	1974	3,842	353	95	95	116,769	15,524	1,882	865	865	506,064	3.23
Bessemer & Lake Erie	1975	20,852	3,192	3,630	3,630	592,226	75,316	8,900	10,892	10,892	1,931,820	12.36
Do	1974	18,475	2,499	3,209	3,209	464,485	62,991	9,288	11,435	9,980	2,540,990	13.47
Boston & Maine	1975	22,052	(1,316)	(1,987)	(1,987)	562,687	88,684	(8,533)	(11,687)	(8,046)	2,501,987	-0-
Do	1974	23,896	1,024	833	833	677,973	91,642	(1,101)	(2,720)	11,220	2,829,583	-0-
Canadian Pacific Lines in Maine	1975	2,226	(697)	-0-	-0-	100,466	10,078	(2,746)	-0-	-0-	530,945	-0-
Do	1974	2,482	(618)	-0-	-0-	122,855	10,556	(1,475)	-0-	-0-	540,776	-0-
Central R. R. Co. of New Jersey	1975	11,796	(2,228)	(2,873)	(2,873)	118,647	46,694	(9,793)	(12,972)	(19,167)	511,131	-0-
Do	1974	12,314	(581)	(649)	(289)	149,916	45,987	(6,804)	(7,102)	(4,742)	610,543	-0-

See footnotes at end of table

Class I line-haul railroads selected earnings data—4 continued
(000 omitted)

District, railroad and year		Quarter ended September 30					Twelve months ended September 30					
		Railway operating revenues	Net railway operating income[1]	Ordinary income[2]	Net income[3]	Net ton-miles of freight	Railway operating revenues	Net operating income[1]	Ordinary income[2]	Net income[3]	Net ton-miles of freight	Return on net investment[4]
												Percent
Eastern district—Continued												
Central Vermont	1975	$2,528	$(186)	$(242)	$(242)	72,833	$9,963	$761	$352	$780	306,686	3.17
Do	1974	2,919	190	76	76	75,236	10,723	690	105	105	353,930	3.17
Chesapeake & Ohio	1975	132,603	6,465	7,344	7,344	5,794,676	163,568	30,036	65,130	65,130	27,685,713	4.84
Do	1974	155,679	15,556	37,523	37,523	7,829,392	152,263	63,483	52,696	52,696	30,318,278	7.67
Chicago & Eastern Illinois	1975	13,910	2,302	1,731	1,731	848,118	54,197	11,852	8,732	8,732	3,348,866	11.47
Do	1974	13,377	2,834	2,098	2,098	930,211	51,556	10,621	9,441	9,441	3,605,914	11.22
Delaware & Hudson	1975	12,544	274	(235)	(235)	596,558	51,493	413	(1,159)	(1,159)	2,367,957	0.53
Do	1974	13,470	555	181	181	673,396	49,591	2,168	1,243	1,543	2,712,088	2.75
Detroit & Toledo Shore Line	1975	2,521	119	136	136	53,995	10,433	509	766	766	216,332	4.08
Do	1974	2,547	203	239	239	55,662	9,439	611	716	716	240,118	4.99
Detroit, Toledo and Ironton	1975	10,725	206	(340)	(340)	282,451	43,987	273	(2,043)	(2,043)	1,265,180	0.42
Do	1974	12,415	703	(332)	(332)	323,443	48,477	1,809	688	688	1,428,416	2.87
Elgin, Joliet & Eastern	1975	18,241	157	734	1,243	194,982	83,954	3,806	4,499	5,005	1,063,668	5.17
Do	1974	25,668	2,590	3,775	3,775	243,604	102,571	11,194	14,880	15,811	541,795	20.02
Erie Lackawanna	1975	70,366	(8,952)	(11,418)	(11,418)	2,201,567	293,369	(29,170)	(39,720)	(39,720)	10,045,006	0
Do	1974	81,930	(3,106)	(6,240)	(6,240)	3,169,481	303,883	17,170	(18,626)	(23,976)	13,678,927	0
Grand Trunk Western	1975	28,800	(1,350)	(1,625)	(1,625)	667,511	116,352	(6,956)	(8,239)	(8,239)	2,826,557	0
Do	1974	26,570	(2,409)	(2,646)	(2,646)	769,249	110,635	(6,165)	(11,297)	(13,362)	3,248,538	0
Illinois Terminal	1975	4,377	702	421	421	120,646	16,743	2,057	872	872	466,040	5.93
Do	1974	4,454	553	229	229	127,076	16,598	2,529	1,411	1,411	489,818	7.92
Lehigh Valley	1975	15,962	(2,710)	(2,697)	(2,697)	640,996	63,001	(15,803)	(16,759)	(16,747)	3,122,981	0
Do	1974	17,997	(302)	(535)	(535)	845,316	66,737	(4,581)	(5,085)	(5,844)	3,497,657	0
Long Island	1975	31,632	(30,186)	(30,729)	(30,729)	7,945	114,910	(128,668)	(130,566)	(130,566)	29,108	0
Do	1974	27,194	(30,221)	(30,622)	(30,622)	7,005	105,737	(93,812)	(95,324)	(95,324)	33,299	0
Maine Central	1975	7,867	384	49	49	185,965	32,012	1,626	780	4,004	795,516	2.80
Do	1974	8,503	706	595	595	227,402	33,201	2,708	2,295	2,295	967,282	4.41
Missouri-Illinois	1975	1,998	869	691	691	56,100	8,672	3,186	1,882	1,882	272,426	8.45
Do	1974	2,186	756	523	523	77,367	8,059	3,676	2,825	2,825	317,249	9.11
Monongahela	1975	1,792	318	(219)	(219)	77,411	7,362	750	(1,330)	(1,330)	347,232	1.69
Do	1974	2,093	573	(101)	(101)	98,249	8,808	2,512	724	724	455,702	5.67
Norfolk & Western	1975	231,294	20,816	14,582	14,582	10,080,169	865,920	93,523	73,067	73,047	47,690,627	4.99
Do	1974	259,574	27,228	24,148	24,148	13,881,506	955,405	132,808	102,847	116,238	54,909,223	7.05

See footnotes at end of table.

Class I line-haul railroads selected earnings data—Continued
(000 omitted)

District, railroad and year		Quarter ended September 30					Twelve months ended September 30					
		Railway operating revenues	Net railway operating income[1]	Ordinary income[2]	Net income[2]	Net ton-miles of freight	Railway operating revenues	Net operating income[1]	Ordinary income[2]	Net income[3]	Net ton-miles of freight	Return on net investments[4]
												Percent
Eastern district—Continued												
Penn Central Transportation Co[5]	1975	$546,591	$(11,324)	$(3,569)	$(3,569)	19,183,286	$2,153,235	$(247,945)	$(233,550)	$(243,550)	80,405,021	- 0 -
Do	1974	591,411	6,769	(21,249)	(21,249)	22,232,679	2,205,512	(64,021)	(165,994)	(165,994)	89,108,977	- 0 -
Penn.-Reading Seashore Lines	1975	2,708	(1,465)	(1,608)	(1,608)	26,428	10,409	(6,528)	(7,040)	(2,218)	110,943	- 0 -
Do	1974	3,126	(1,029)	(1,147)	(1,147)	35,841	11,527	(4,490)	(5,032)	1,036	131,564	- 0 -
Pittsburgh & Lake Erie	1975	10,737	1,651	1,066	1,066	284,020	50,650	9,437	8,694	8,694	1,329,209	4.11
Do	1974	14,209	2,969	2,983	2,983	415,449	50,011	10,686	10,047	10,047	1,646,304	4.61
Reading	1975	32,982	(4,465)	(5,974)	(5,974)	760,787	142,440	(15,086)	(18,537)	(18,537)	3,355,519	6.19
Do	1974	39,379	1,569	684	2,792	945,861	144,705	(3,114)	(7,237)	(5,129)	3,938,464	- 0 -
Richmond, Fredericksburg & Potomac	1975	6,919	846	2,259	2,259	233,472	28,723	4,831	8,011	8,011	1,025,149	7.35
Do	1974	8,123	1,208	1,933	1,933	280,472	31,524	5,974	8,519	8,519	1,245,641	10.20
Western Maryland	1975	16,797	2,466	2,514	2,514	574,880	74,317	9,057	10,109	10,109	2,625,940	6.55
Do	1974	19,351	2,580	4,266	4,266	912,351	68,420	8,407	8,087	8,087	3,758,831	5.86
Southern district												
Atlanta & West Point[3]	1975	1,676	(19)	(33)	(33)	97,438	6,597	(376)	(433)	(433)	397,401	- 0 -
Do	1974	2,037	155	158	158	126,465	7,990	857	490	490	....	8.80
Auto-Train	1975	6,806	576	322	322	....	27,737	1,558	606	606	....	7.84
Do	1974	7,003	407	198	198	....	24,959	2,248	1,427	1,427	....	16.21
Clinchfield	1975	10,884	3,284	0	0	696,257	44,300	10,539	0	0	3,046,371	8.34
Do	1974	12,926	4,053	0	0	863,105	46,842	12,846	0	0	3,537,999	11.45
Florida East Coast	1975	10,004	1,067	1,521	1,521	349,973	41,857	2,781	4,788	4,788	627,978	3.58
Do	1974	11,016	822	1,389	1,389	398,772	48,982	5,101	7,511	7,511	1,959,432	7.12
Georgia R.R.-Lessee Organization	1975	4,138	546	0	0	246,363	15,046	958	0	0	917,478	3.47
Do	1974	3,969	258	0	0	258,330	13,612	(292)	0	0	815,070	- 0 -
Illinois Central Gulf	1975	137,111	5,353	50	50	6,226,177	549,743	10,289	874	9,322	27,698,320	0.98
Do	1974	144,745	7,877	6,412	6,412	7,833,806	566,345	36,201	32,275	32,275	34,356,917	3.71
Louisville & Nashville	1975	142,423	12,910	5,733	5,733	8,975,633	598,837	53,264	28,122	28,122	36,227,388	5.16
Do	1974	157,493	14,201	11,142	11,142	9,524,449	583,433	59,596	44,584	44,584	38,166,990	5.82
Seaboard Coast Line	1975	154,306	9,237	12,171	12,171	7,457,319	634,999	27,800	53,696	53,696	32,120,305	2.38
Do	1974	165,928	5,363	20,512	20,512	8,747,290	672,463	52,922	46,024	46,024	36,207,779	4.68
Southern Railway System	1975	216,707	28,109	19,925	19,925	10,435,383	831,908	96,460	111,435	115,305	42,631,539	6.12
Do	1974	232,980	25,460	22,279	22,279	12,146,391	885,280	140,110	117,652	117,652	49,669,465	9.38
Western Ry. of Alabama[3]	1975	1,687	(22)	(43)	(43)	107,838	6,833	(265)	(333)	(333)	446,853	- 0 -
Do	1974	2,078	122	168	168	140,236	8,267	548	310	310	....	5.35

See footnotes at end of table.

Class I line-haul railroads selected earnings data—Continued
(000 omitted)

District, railroad and year		Quarter ended September 30					Twelve months ended September 30					
		Railway operating revenues	Net railway operating income[1]	Ordinary income[2]	Net income[3]	Net ton-miles of freight	Railway operating revenues	Net operating income[1]	Ordinary income[2]	Net income[3]	Net ton-miles of freight	Return on net investments[4]
Western district												*Percent*
Atchison, Topeka & Santa Fe	1975	$283,360	$31,483	$26,885	$26,885	13,460,196	$1,032,763	$61,771	$53,271	$53,271	53,164,570	3.62
Do	1974	279,554	21,393	23,019	23,019	14,084,143	1,054,566	83,930	91,087	91,087	60,365,001	5.09
Burlington Northern	1975	348,418	24,701	24,393	27,766	21,335,530	1,296,884	30,609	35,268	38,641	74,209,796	1.33
Do	1974	332,578	17,093	19,280	19,280	21,367,935	1,237,000	80,509	81,979	81,979	76,675,750	3.55
Chicago & North Western	1975	119,697	670	(1,521)	(1,521)	5,075,733	458,453	(11,863)	(22,636)	(22,636)	22,161,968	- 0 -
Do	1974	125,646	2,820	31	31	6,154,024	470,899	14,150	2,574	4,985	25,092,686	5.15
Chicago, Milwaukee, St. Paul & Pacific	1975	99,487	(4,879)	(2,436)	(2,436)	4,008,839	371,923	(32,192)	(26,903)	(26,903)	17,040,746	- 0 -
Do	1974	100,728	(3,974)	1,130	1,130	4,199,076	384,372	519	4,777	4,777	18,446,351	0.08
Chicago, Rock Island & Pacific	1975	82,777	(3,892)	(3,908)	(3,908)	3,677,200	330,744	(40,390)	(42,034)	(42,034)	16,160,727	- 0 -
Do	1974	94,607	(3,071)	(2,924)	(2,924)	4,642,324	358,124	(20,748)	(17,857)	(17,857)	20,788,880	- 0 -
Colorado & Southern	1975	9,782	1,097	2,008	2,008	500,629	34,856	2,963	4,584	4,769	2,011,329	4.25
Do	1974	8,987	734	(263)	(263)	601,832	35,329	5,513	4,656	4,656	2,611,358	8.69
Denver & Rio Grande Western	1975	40,799	5,494	4,350	4,350	2,401,665	146,856	17,982	18,036	18,036	8,477,280	6.61
Do	1974	38,678	5,111	5,119	5,119	2,314,332	134,409	18,305	17,165	19,115	8,957,915	7.10
Duluth, Missabe & Iron Range	1975	24,703	4,409	4,540	5,425	797,253	71,005	5,230	6,426	7,311	2,505,033	5.80
Do	1974	28,013	6,815	7,640	7,640	1,043,238	70,704	9,754	12,183	13,616	2,832,763	11.16
Duluth, Winnipeg & Pacific	1975	3,741	514	431	431	184,865	16,172	4,226	3,947	3,947	892,864	37.30
Do	1974	4,350	1,141	1,049	1,049	230,672	16,926	4,257	3,887	3,887	1,069,905	43.20
Fort Worth & Denver	1975	10,596	1,404	1,497	1,497	550,510	36,692	3,104	3,129	3,221	2,204,639	6.63
Do	1974	8,143	(1,107)	(951)	(951)	451,983	35,520	(5,348)	(5,538)	(5,538)	2,492,345	- 0 -
Green Bay & Western	1975	2,575	63	156	156	73,080	9,763	(69)	256	(633)	294,391	- 0 -
Do	1974	2,642	(93)	26	26	81,215	9,720	63	308	308	328,968	0.49
Kansas City Southern	1975	31,405	1,028	(246)	(246)	1,474,281	127,305	6,515	1,370	1,370	6,361,524	3.23
Do	1974	33,656	2,840	1,472	1,472	1,653,192	130,039	6,113	1,443	1,443	7,798,479	3.05
Lake Superior & Ishpeming	1975	3,923	451	381	381	60,759	9,027	663	691	691	143,480	3.89
Do	1974	1,978	298	188	188	10,495	6,239	(439)	(667)	(667)	34,069	- 0 -
Minneapolis, Northfield & Southern	1975	1,384	(7)	34	34	20,308	5,203	(98)	149	277	69,363	- 0 -
Do	1974	1,311	9	60	60	21,835	5,124	201	361	651	....	2.35
Missouri-Kansas-Texas	1975	21,029	(2,213)	(2,186)	(2,186)	979,203	87,423	(3,978)	(5,115)	(5,115)	4,779,661	- 0 -
Do	1974	22,989	(1,482)	(1,885)	(1,885)	1,196,217	94,720	(1,491)	(2,590)	(2,590)	5,947,237	- 0 -
Missouri Pacific	1975	153,362	13,186	11,027	11,027	7,921,470	623,719	40,228	33,811	33,811	34,048,337	4.67
Do	1974	160,968	16,682	15,932	15,932	9,268,882	611,332	59,232	49,472	49,472	40,048,995	7.04
Northwestern Pacific	1975	3,024	(900)	(990)	(990)	101,853	10,627	(4,699)	(6,536)	(6,536)	377,838	- 0 -
Do	1974	3,470	(400)	(328)	(328)	119,243	13,511	(1,551)	5,366	5,366	533,866	- 0 -

See footnotes at end of table

Class I line-haul railroads selected earnings data—Continued
(000 *omitted*)

District, railroad and year		Quarter ended September 30					Twelve months ended September 30					
		Railway operating revenues	Net railway operating income[1]	Ordinary income[2]	Net income[3]	Net ton-miles of freight	Railway operating revenues	Net operating income[1]	Ordinary income[2]	Net income[3]	Net ton-miles of freight	Return on net investment[4]
												Percent
Western district—*Continued*												
Oregon Electric	1975	$1,632	$(120)	$(77)	$(77)	35,733	$6,102	$(621)	$(452)	$(452)	117,042	-0-
Do	1974	1,927	78	127	127	40,690	7,138	47	225	225	165,195	0.39
St. Louis-San Francisco	1975	70,846	4,574	1,665	1,665	3,373,647	272,770	17,737	7,134	7,134	13,909,457	4.04
Do	1974	72,429	4,840	3,096	3,096	3,725,260	279,696	22,441	18,184	18,184	15,855,172	5.26
St. Louis Southwestern	1975	42,630	7,486	6,572	6,572	2,075,873	173,239	29,140	26,279	26,279	9,262,887	7.41
Do	1974	46,448	9,356	9,051	9,051	2,393,000	180,059	44,190	44,443	44,443	10,380,031	12.35
Soo Line	1975	40,050	2,445	1,885	1,885	2,038,034	162,055	11,785	9,532	9,532	8,950,667	4.01
Do	1974	44,032	3,319	2,974	2,974	2,411,958	179,915	17,367	16,186	16,186	11,266,118	6.07
Southern Pacific Transp. Co.	1975	330,805	25,350	31,001	31,001	15,368,491	1,256,965	24,157	43,510	43,510	61,380,565	0.75
Do	1974	343,434	18,623	26,373	26,373	17,664,494	1,310,014	89,537	119,070	119,070	73,215,888	4.40
Spokane International[5]	1975	1,715	564	454	454	66,028	7,109	251	146	146	267,109	2.66
Do	1974	1,344	(398)	(399)	(399)	46,374	6,827	136	628	628	....	1.57
Texas & Pacific	1975	36,383	3,728	2,397	2,397	1,820,395	147,259	12,258	7,194	7,194	7,808,909	4.71
Do	1974	37,062	3,182	2,497	2,497	2,155,023	144,374	12,888	10,293	12,065	9,485,647	5.38
Texas Mexican	1975	2,369	(16)	47	47	49,143	11,101	452	928	928	236,165	5.32
Do	1974	2,982	216	556	556	62,101	10,751	1,107	1,418	1,232	242,943	14.72
Toledo, Peoria & Western	1975	3,741	118	117	117	125,238	14,982	226	423	355	526,599	1.92
Do	1974	3,620	107	73	73	130,742	13,892	441	399	399	541,191	3.90
Union Pacific	1975	261,178	32,650	25,396	25,396	14,949,573	969,043	108,612	81,372	81,372	53,310,109	5.85
Do	1974	255,229	33,521	26,416	26,416	14,971,903	971,455	156,076	129,606	129,606	60,987,725	8.91
Western Pacific	1975	29,045	2,524	2,037	2,037	1,233,804	103,793	650	(279)	(279)	4,995,506	0.37
Do	1974	29,035	1,500	1,461	1,461	1,578,616	99,944	4,470	4,057	5,561	5,775,543	2.54

[1] Net railway operating income—difference between railway operating revenues and the total of railway operating expenses, railway tax accruals and net equipment and joint facility rents. Does not include fixed charges and nonoperating income.

[2] Ordinary income—net income, after including fixed charges and nonoperating income, but *before* extraordinary and prior period charges and credits.

[3] Net income—net income after extraordinary and prior period charges and credits.

[4] Return on net investment—ratio of net railway operating income to net investment in railway property used in transportation service at beginning of calendar year. Net investment does not include working capital, pending a Commission decision in Ex Parte No. 271, Net Investment—Railroad Rate Base. The symbol - 0 - indicates a deficit net railway operating income.

[5] Net ton-miles of freight—data for the 12 months ending September 30, 1974 were not available because these railroads became class I carriers on January 1, 1974. Net ton miles for these railroads for the 12 months ending September 30, 1975, are not included in the grand totals, in order to provide comparability.

[6] Difference between ordinary and net income, as reported by Penn Central, represents grant funds received for continuance of operations (pursuant to section 213 of the Regional Rail Reorganization Act of 1973). The I.C.C.'s Accounting Board on November 10, 1975, permitted the railroad to record the grant funds as an extraordinary income item. Penn Central had previously credited Other Capital Surplus.

NOTE: *Changes in Commission's accounting regulations.*

Data shown in this report for third quarters 1975 and 1974 and the 12 months ending September 30, 1975, reflect the interperiod tax allocation method of accounting for income taxes (deferred taxes) and the equity method of accounting for certain long-term investments in common stocks, in accordance with changes in the Commission's accounting regulations effective January 1, 1974. Data for the 12 months ending September 30, 1974, do not include these items.

For informational purposes only, the composite data for these periods, restated to exclude these accounting changes, are shown below. Elimination of provision for deferred taxes increased net railway operating income, ordinary and net income. The exclusion of equity in undistributed earnings of affiliates reduced ordinary and net income but it had no effect on net railway operating income.

	(000 omitted) Quarter ended September 30, 1975			(000 omitted) Quarter ended September 30, 1974		
	Net railway operating income	Ordinary income	Net income	Net railway operating income	Ordinary income	Net income
Totals, as reported by class I freight railroads	$190,839	$147,601	$152,368	$255,461	$264,864	$249,332
Adjustment to eliminate:						
(1) Provision for deferred taxes-expense	33,084	33,084	33,084	60,248	60,248	60,248
(2) Equity in undistributed earnings of affiliates income		33,310	33,310		57,366	57,366
Totals, restated to eliminate above accounting changes	223,923	147,375	152,142	315,709	267,746	252,214

	(000 omitted) Twelve months ended September 30, 1975				(000 omitted) Twelve months ended September 30, 1974			
	Net railway operating income	Ordinary income	Net income	Return on investment	Net railway operating income	Ordinary income	Net income	Return on investment
				Percent				*Percent*
Totals, as reported by class I freight railroads	$223,653	$167,364	$180,282	0.77	$1,050,490	$797,883	$843,719	3.88
Adjustments to eliminate:								
(1) Provision for deferred taxes-expense	131,969	131,969	131,969		No eliminations are necessary			
(2) Equity in undistributed earnings of affiliates income		131,149	131,149					
Totals, restated to eliminate above accounting changes	355,622	168,184	181,102	1.23	1,050,490	797,883	843,719	3.88

( ) Represents loss.

APPENDIX G

Rate base and depreciation analysis

TABLE 1

Comparison of reported and calculated accrued depreciation
as of December 31, 1974 Class I RR—National

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
		(000)	*(000)*	*(000)*	*(000)*
001	Engineering	$355,055.	$51,710.	$96,358.	$-44,648.
02X	Other R-O-W **expenditures**	11,873.	2,934.	3,446.	-512.
003	Grading	2,678,516.	90,948.	1,054,719.	-963,771.
005	Tunnels and subways	237,251.	43,585.	83,625.	-40,040.
006	**Bridges**, trestles and culverts.	1,783,665.	831,946.	648,351.	183,595.
007	Elevated structures	130.	72.	68.	4.
013	Fences, snowsheds and signs	79,647.	67,330.	40,401.	26,929.
016	Station and office buildings	723,482.	262,149.	254,272.	7,877.
017	Roadway buildings	62,242.	16,417.	23,668.	-7,251.
018	Water stations	20,778.	-2,709.	13,922.	-16,631.
019	Fuel stations	38,916.	7,211.	19,334.	-12,123.
020	Shops and enginehouses	516,798.	154,269.	207,144.	-52,875.
021	Grain elevators	5.	-2.	3.	-5.
022	Storage warehouses	2,197.	1,614.	1,202.	512.
023	Wharves and docks	27,699.	19,310.	13,543.	5,767
024	Coal and Ore wharves	145,436.	56,817.	45,870.	10,947.
025	TOFC/COFC terminals	59,418.	9,631.	9,372.	259.
026	Communication systems	284,049.	94,511.	71,426.	23,085.
027	Signals and interlockers	948,296.	382,127.	303,486.	78,641.
029	Power plants	11,649.	2,648.	6,208.	-3,560.
031	Power-Transmission Systems	68,097.	42,377.	28,699.	13,678.
035	Miscellaneous structures	17,146.	5,812.	6,580.	-768.
037	Roadway machines	313,217.	156,316.	95,939.	60,377.
039	Public improvements—Construction.	325,836.	106,846.	116,427.	-9,581.
044	**Shop Machinery**	244,801.	67,195.	90,917.	-23,722.
045	**Power-plant machinery**	36,090.	13,288.	15,380.	-2,092.
	Road accounts	8,992,289.	2,484,352.	3,250,260.	-765,908.
	Equipment				
052	Locomotives	3,700,354.	1,895,666.	1,668,730.	226,936.
053	Freight-train cars	10,701,148.	3,492,359.	3,225,592.	266,767.
054	Passenger-train cars	97,125.	73,612.	71,732.	1,880.
055	Highway revenue equipment	58,012.	35,392.	30,292.	5,100.
056	Floating equipment	39,292.	19,747.	19,826.	-79.

Comparison of reported and calculated accrued depreciation as of December 31, 1974
Class I RR—National—Continued

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
	Equipment—Continued	*(000)*	*(000)*	*(000)*	*(000)*
057	Work equipment	$278,208.	$133,566.	$133,920.	$ -354.
058	Miscellaneous	138,631.	76,566.	53,308.	23,258.
	Equipment accounts	14,972,770.	5,726,908.	5,203,400.	523,508.
	Totals (including 3, 5, & 39).	23,965,059.	8,211,260.	8,453,660.	-242,400.
	Net investment with depreciation of 3, 5, & 39.		15,753,799.	15,511,399.	242,400.
	Totals (excluding 3, 5, & 39).	20,723,456.	7,969,881.	7,198,889.	770,992.
	Net investment without depreciation of 3, 5, & 39.		12,753,575.	13,524,567.	770,992.

TABLE 2

Comparison of reported and calculated accrued depreciation as of December 31, 1974
Class I RR—Region I

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
		(000)	*(000)*	*(000)*	*(000)*
001	Engineering	$8,818.	$-211.	$1,610.	$-1,821.
02X	Other R-O-W expenditures	72	27	25.	2.
003	Grading	55,446.	1,410.	27,928.	-26,518.
005	Tunnels and subways	4,711.	111.	2,469.	-2,358.
006	Bridges, trestles and culverts	43,314.	17,225.	20,113.	-2,888.
013	Fences, snowsheds, and signs	2,134.	1,552.	1,143.	409.
016	Station and office buildings	8,666.	-1,753.	3,979.	-5,732.
017	Roadway buildings	608.	90.	252.	-162.
018	Water stations	178.	125.	113.	12.

Comparison of reported and calculated accrued depreciation as of December 31, 1974
Class I RR—Region I—Continued

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
		(000)	*(000)*	*(000)*	*(000)*
019	Fuel stations	$ 903.	$ 365.	$ 543.	$ -178.
020	Shops and enginehouses	12,402.	2,342.	6,218.	-3,876.
022	Storage warehouses	153.	39.	31.	8.
023	Wharves and docks	725.	544.	444.	100.
024	Coal and ore wharves	14.	10.	11.	-1.
025	TOFC-COFC terminals	1,108.	146.	130.	16.
026	Communication systems	2,010.	723.	586.	137.
027	Signals and interlockers	19,719.	6,101.	8,186.	-2,085.
029	Power plants	389.	99.	231.	-132.
031	Power-transmission systems	1,092.	326.	504.	-178.
035	Miscellaneous structures	128.	95.	93.	2.
037	Roadway machines	7,718.	2,959.	2,474.	485.
039	Public improvements—construction	7,767.	508.	3,839.	-3,331.
044	Shop machinery	3,503.	1,227.	1,647.	-420.
045	Power-plant machinery	792.	-133.	439.	-572.
	Road accounts	182,370.	33,927.	83,008.	-49,081.
	Equipment				
052	Locomotives	36,796.	32,559.	17,767.	14,792.
053	Freight-train cars	93,055.	40,493.	39,532.	961.
054	Passenger-train cars	14,180.	8,778.	8,778.	0.
055	Highway revenue equipment	658.	902.	592.	310.
057	Work equipment	3,238.	2,079.	2,087.	-8.
058	Miscellaneous equipment	1,451.	690.	676.	14.
	Equipment accounts	149,378.	85,501.	69,432.	16,069.
	Totals (including 3, 5 & 39)	331,748.	119,428.	152,440.	-33,012.
	Net investment with depreciation of 3, 5 & 39		212,320.	179,308.	33,012.
	Totals (excluding 3, 5 & 39)	263,824.	117,399.	118,204.	-805.
	Net investment without depreciation of 3, 5 & 39		146,425.	145,620.	805.

TABLE 3

Comparison of report and calculated accrued depreciation as of December 31, 1974—Class I RR—Region II

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
		(000)	*(000)*	*(000)*	*(000)*
001	Engineering	$91,600.	$10,724.	$23,395.	$-12,671.
02X	Other R-O-W Expenditures	1,692.	609.	695.	-86.
003	Grading	551,260.	20,571.	220,258.	-199,687.
005	Tunnels and subways	73,024.	11,258.	25,104.	-13,846.
006	Bridges, trestles and culverts.	387,140.	155,994.	152,907.	3,087.
007	Elevated structures	130.	72.	68.	4.
013	Fences, snowsheds, and signs.	10,508.	10,590.	9,457.	1,133.
016	Station and office buildings	160,235.	60,269.	62,128.	-1,859.
017	Roadway buildings	9,295.	3,253.	3,511.	-258.
018	Water stations	4,609.	-4,184.	2,913.	-7,097.
019	Fuel stations	9,460.	18.	4,290.	-4,272.
020	Shops and enginehouses	129,740.	37,487.	50,097.	-12,610.
021	Grain elevators	5.	-2.	3.	-5.
022	Storage warehouses	1,438.	1,012.	742.	270.
023	Wharves and docks	16,477.	9,955.	8,475.	1,480.
024	Coal and ore wharves	97,345.	24,218.	26,363.	-2,145.
025	TOFC-COFC terminals	9,632.	1,419.	1,478.	-59.
026	Communication systems	40,650.	17,657.	12,686.	4,971.
027	Signals and interlockers	220,908.	94,913.	73,151.	21,762.
029	Power plants	3,622.	731.	1,828.	-1,097.
031.	Power-transmission systems.	25,810.	16,639.	10,477.	6,162.
035	Miscellaneous structures	3,734.	909.	1,500.	-591.
037	Roadway machines	63,299.	38,036.	20,842.	17,194.
039	Public improvements—Construction.	79,303.	26,984.	30,020.	-3,036.
044	Shop machinery	63,305.	23,195.	24,167.	-972.
045	Power-plant machinery	13,825.	7,060.	5,810.	1,250.
	Road accounts	2,068,046.	569,387.	772,365.	-202,978.
	Equipment				
052	Locomotives	722,572.	442,967.	325,131.	117,836.
053	Freight-train cars	2,535,947.	873,863.	788,645.	85,218.
054	Passenger-train cars	19,075.	15,487.	14,886.	601.
055	Highway revenue equipment.	15,981.	10,112.	8,130.	1,982.

Comparison of report and calculated accrued depreciation as of December 31, 1974
Class I RR—Region II—Continued

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
	Equipment—Continued	*(000)*	*(000)*	*(000)*	*(000)*
056	Floating equipment	$ 36,187.	$ 18,061.	$ 18,138.	$ -77.
057	Work equipment	39,657.	27,342.	28,606.	-1,264.
058	Miscellaneous equipment	22,542.	10,629.	9,055.	1,574.
	Equipment accounts	3,391,961	1,398,461.	1,192,591.	205,870.
	Totals (including 3, 5 & 39)	5,460,007.	1,967,848.	1,964,956.	2,892.
	Net investment with deciation of 3, 5 & 39.	-------	3,492,159.	3,495,051.	2,892.
	Totals (excluding 3, 5, & 39).	4,756,420	1,909,035.	1,689,574.	219,461
	Net investment without depreciation of 3, 5, & 39.		2,847,385.	3,066,846.	219,461.

TABLE 4

Comparison of reported and calculated accrued depreciation as of December 31, 1974
Class I RR—Region IV

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
		(000)	*(000)*	*(000)*	*(000)*
001	Engineering	$71,307.	$8,532.	$17,794.	$-9,262.
02X	Other R-O-W expenditures	2,680.	261.	739.	-478.
003	Grading	590,805.	12,749.	229,506.	-216,757.
005	Tunnels and subways	28,769.	3,756.	12,478.	-8,722.
006	Bridges, trestles, and culverts	417,295.	155,007.	147,092.	7,915.
013	Fences, snowsheds and signs	9,261.	7,023.	5,104.	1,919.
016	Station and office buildings	156,222.	52,069.	51,118.	951.
017	Roadway buildings	12,055.	2,405.	4,159.	-1,754.
018	Water stations	2,043.	1,479.	1,261.	218.

Comparison of reported and calculated accrued depreciation as of December 31, 1974
Class I RR—Region IV—Continued

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
		(000)	*(000)*	*(000)*	*(000)*
019	Fuel stations	$7,242.	$2,849.	$ 3,707.	$ -858.
020	Shops and enginehouses	97,007.	21,467.	38,715.	-17,248.
022	Storage warehouses	565.	536.	307.	229.
023	Wharves and docks	3,486.	3,363.	1,871.	1,492.
024	Coal and ore wharves	2,975.	1,323.	1,040.	283.
025	TOFC/COFC terminals	13,783.	1,868.	1,917.	-49.
026	Communication systems	52,850.	13,344.	13,334.	10.
027	Signals and interlockers	215,427.	71,598.	60,610.	10,988.
029	Power plants	1,351.	291.	665.	-374.
031	Power-transmission systems	12,338.	7,581.	5,300.	2,281.
035	Miscellaneous structures	4,373.	1,583.	1,372.	211.
037	Roadway machines	71,430.	37,075.	20,927.	16,148.
039	Public improvements—construction	55,234.	17,737.	19,022.	-1,285.
044	Shop machinery	47,590.	11,298.	19,731.	-8,433.
045	Power-plant machinery	4,164.	500.	1,846.	-1,346.
	Road accounts	1,880,252.	435,694.	659,615.	-223,921.
	Equipment				
052	Locomotives	803,382.	391,237.	355,544.	35,693.
053	Freight-train cars	2,533,552.	798,651.	689,421.	109,230.
054	Passenger-train cars	17,949.	16,240.	16,184.	56.
055	Highway revenue equipment	31,809.	17,634.	17,779.	-145.
056	Floating equipment	15.	11.	11.	0.
057	Work equipment	64,949.	31,313.	30,001.	1,312.
058	Miscellaneous equipment	22,297.	12,468.	9,941.	2,527.
	Equipment accounts	3,473,953.	1,267,554.	1,118,881.	148,673.
	Totals (including 3, 5 & 39)	5,354,205.	1,703,248.	1,778,496.	-75,248.
	Net investment with depreciation of 3, 5 & 39	----------------.	3,650,957.	3,575,709.	75,248.
	Totals (excluding 3, 5, & 39)	4,679,397.	1,669,006.	1,517,490.	151,516.
	Net investment without depreciation of 3, 5 & 39	----------------	3,010,391.	3,161,907.	151,516.

best copy available

TABLE 5

Comparison of reported and calculated accrued depreciation as of December 31, 1974
Class I RR—Region V

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
		(000)	*(000)*	*(000)*	*(000)*
001	Engineering	$39,572.	$6,801.	$10,870.	$-4,069.
02X	Other R-O-W expenditures	1,672.	860.	629.	231.
003	Grading	370,990.	15,181.	153,306.	-138,125.
005	Tunnels and subways	4,220.	682.	1,426.	-744.
006	Bridges, trestles, and culverts	294,662.	152,372.	117,863.	34,509.
013	Fences, snowsheds, and signs	15,232.	11,862.	7,757.	4,105.
016	Station and office buildings	94,405.	29,041.	32,983.	-3,942.
017	Roadway buildings	4,113.	1,504.	1,722.	-218.
018	Water stations	2,474.	914.	1,648.	-734.
019	Fuel stations	6,211.	2,196.	3,035.	-839.
020	Shops and enginehouses	74,518.	24,758.	29,751.	-4,993.
023	Wharves and docks	1,613.	1,304.	663.	641.
024	Coal and ore wharves	24,432.	19,546.	12,132.	7,414.
025	TOFC COFC terminals	9,894.	2,054.	1,247.	807.
026	Communication systems	32,026.	9,049.	9,666.	-617.
027	Signals and interlockers	113,325.	56,538.	39,106.	17,432.
029	Power plants	977.	292.	577.	-285.
031	Power-transmission systems	6,236.	3,884.	2,039.	1,845.
035	Miscellaneous structures	3,668.	986.	1,647.	-661.
037	Roadway machines	38,532.	18,285.	12,796.	5,489.
039	Public improvements—construction	48,240.	17,224.	17,055.	169.
044	Shop machinery	31,955.	6,813.	11,882.	-5,069.
045	Power-plant machinery	2,661.	1,041.	1,316.	-275.
	Road accounts	1,221,628.	383,187.	471,116.	-87,929.
	Equipment				
052	Locomotives	445,090.	245,378.	225,637.	19,741.
053	Freight-train cars	1,472,463.	475,122.	440,183.	34,939.
054	Passenger-train cars	8,028.	4,543.	4,543.	0.
056	Floating equipment	413.	207.	205.	2.
057	Work equipment	27,668.	12,183.	12,512.	-329.

Comparison of reported and calculated accrued depreciation as of December 31, 1974
Class I RR—Region V—Continued

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
	Equipment—Continued	*(000)*	*(000)*	*(000)*	*(000)*
058	Miscellaneous equipment ----	$19,061.	$9,515.	$7,247.	$2,268.
	Equipment accounts --------	1,972,723.	746,948.	690,327.	56,621.
	Totals (including 3, 5, & 39)------------------------------	3,194,351.	1,130,135.	1,161,443.	-31,308.
	Net investment with depreciation of 3, 5 & 39------	-----------------	2,064,216.	2,032,908.	31,308.
	Totals (excluding 3, 5, & 39)------------------------------	2,770,901.	1,097,048.	989,656.	107,392.
	Net investment without depreciation of 3, 5 & 39--	-----------------	1,673,853.	1,781,245.	107,392.

TABLE 6

Comparison of reported and calculated accrued depreciation as of December 31, 1974
Class I RR—Region VI

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
		(000)	*(000)*	*(000)*	*(000)*
001	Engineering ----------------------	$143,758.	$25,864.	$42,689.	$-16,825.
02X	Other R-O-W expenditures ----------------------------------	5,757.	1,177.	1,357.	-180.
003	Grading --------------------------	1,110,015.	41,037.	423,721.	-382,684.
005	Tunnels and subways----------	126,527.	27,778.	42,148.	-14,370.
006	Bridges, trestles, and culverts ----------------------------	641,254.	351,348.	210,662.	140,686.
013	Fences, snowsheds, and signs -----------------------------	42,512.	36,303.	20,547.	15,756.
016	Station and office buildings ------------------------------	303,954.	122,523.	104,062.	18,461.
017	Roadway buildings -------------	36,171.	9,165.	14,027.	-4,862.
018	Water stations------------------	11,474.	-1,043.	7,988.	-9,031.
019	Fuel stations---------------------	15,100.	1,783.	7,758.	-5,975.
020	Shops and enginehouses -----	203,131.	68,215.	82,360.	-14,145.

Comparison of reported and calculated accrued depreciation as of December 31, 1974
Class I RR—Region VI—Continued

Account No.	Title of account	Reported base (1)	Reported reserve (2)	Calculated reserve (3)	Difference (Col. 2-Col. 3) (4)
		(000)	*(000)*	*(000)*	*(000)*
022	Storage warehouses	$41.	$27.	$23.	$4.
023	Wharves and docks	5,398.	4,144.	2,091.	2,053.
024	Coal and ore wharves	20,670.	11,720.	6,325.	5,395.
025	TOFC/COFC terminals	25,001.	4,144.	4,599.	-455.
026	Communication systems	156,513.	53,738.	35,164.	18,574.
027	Signals and interlockers	378,917.	152,977.	122,406.	30,571.
029	Power plants	5,310.	1,235.	2,906.	-1,671.
031	Power-transmission systems	22,621.	13,947.	10,382.	3,565.
035	Miscellaneous structures	5,243.	2,239.	1,968.	271.
037	Roadway machines	132,238.	59,961.	38,897.	21,064.
039	Public improvements—construction	135,292.	44,393.	46,483.	-2,090.
044	Shop machinery	98,448.	24,662.	33,528.	-8,866.
045	Power-plant machinery	14,648.	4,820.	5,975.	-1,155.
	Road accounts	3,639,993.	1,062,157.	1,268,066.	-205,909.
	Equipment				
052	Locomotives	1,692,514.	783,525.	743,702.	39,823.
053	Freight-train cars	4,066,131.	1,304,230.	1,268,305.	35,925.
054	Passenger-train cars	37,893.	28,564.	27,381.	1,183.
055	Highway revenue equipment	9,564.	6,744.	3,565.	3,179.
056	Floating equipment	2,677.	1,468.	1,470.	-2.
057	Work equipment	102,696.	60,649.	60,666.	-17.
058	Miscellaneous equipment	73,280.	43,264.	26,436.	16,828.
	Equipment accounts	5,984,755.	2,228,444.	2,131,525.	96,919.
	Totals (including 3, 5, & 39)	9,624,748.	3,290,601.	3,399,591.	-108,990.
	Net investment with depreciation of 3, 5 & 39		6,334,147.	6,225,157.	108,990.
	Totals (excluding 3, 5, & 39)	8,252,914.	3,177,393.	2,887,239.	290,154.
	Net investment without depreciation of 3, 5 & 39		5,075,521.	5,365,675.	290.154.

Carriers included in the analysis

REGION I

Bangor and Aroostook RR Co.
Boston and Maine Corp.
Central Vermont Railway, Inc.
Maine Central Railroad Co.

REGION II

Akron, Canton & Youngstown Railroad Co.
Ann Arbor Railroad Co.
Baltimore & Ohio Railroad Co.
Bessemer & Lake Erie Railroad Co.
Chesapeake & Ohio Railway Co.
Chicago & Eastern Illinois Railroad Co.
Detroit & Toledo Shore Line Railroad Co.
Detroit, Toledo & Ironton Railroad Co.
Elgin, Joliet & Eastern Railway Co.
Erie, Lackawanna Railway Co.
Grand Trunk Western Railroad Co.
Lehigh Valley Railroad Co.
Missouri-Illinois Railroad Co.
Monongahela Railway Co.
Norfolk and Western Railway Co.
Pennsylvania-Reading Seashore Lines
Pittsburgh & Lake Erie Railroad Co.
Reading Co.
Richmond, Fredericksburg & Potomac Railroad Co.
Western Maryland Railway Co.

REGION IV

Alabama Great Southern RR Co.
Central of Georgia Railway Co.
Cincinnati, New Orleans & Texas Pacific Railway Co.
Clinchfield Railroad Co.
Florida East Coast Railway Co.
Georgia Railroad - Lessee Organization
Georgia Southern & Florida Railway Co.
Illinois Central Gulf Railroad Co.
Louisville & Nashville Railroad Co.
Seaboard Coast Line Railroad Co.
Southern Railway Co.

REGION V

Chicago, Rock Island & Pacific Railroad Co.
Duluth, Missabe & Iron Range Railway Co.

REGION V—CONTINUED

Duluth, Winnipeg & Pacific Railway Co.
Fort Worth & Denver Railway Co.
Green Bay & Western Railroad
Kansas City Southern Railway Co.
Lake Superior & Ishpeming Railroad Co. (equipment)
Louisiana & Arkansas Railway Co.
Missouri-Kansas-Texas Railroad Co.
Missouri Pacific Railroad Co.
St. Louis - San Francisco Railway Co.
St. Louis Southwestern Railway Co.
Soo Line Railroad Co.
Texas & Pacific Railway Co.
Toledo, Peoria & Western Railroad Co.

REGION VI

Atchison, Topeka & Santa Fe Railway Co.
Burlington Northern Inc.
Chicago, Milwaukee, St. Paul & Pacific Railroad Co.
Colorado & Southern Railway Co.
Denver & Rio Grande Western Railroad Co.
Northwestern Pacific Railroad Co.
Southern Pacific Transportation Co.
Union Pacific Railroad Co.
Texas Mexican Railway Co.
Western Pacific Railroad Co.

CARRIERS EXCLUDED FROM THE DATA BASE

New class I carriers for which data was not available:
Atlanta & West Point Railroad Co.
Minneapolis, Northfield & Southern Railway
Spokane International Railroad
Western Railway of Alabama

Carriers for which data was not requested:
Auto Train Corp.
Canadian Pacific Lines in Maine
Central of New Jersey
Chicago and North Western Transportation Co.
Delaware and Hudson Railway Co.
Illinois Terminal Railroad Co.
Lake Superior & Ishpeming Railroad Co. (Road Property)
Long Island Railroad Co.
National Rail Passenger Corp. (Amtrak)
Oregon Electric Railway

Carriers which have not reported:
Penn Central Transportation Co.

BASIS FOR CALCULATED ACCRUED DEPRECIATION AMOUNTS

The present provisions for the accrued depreciation account reported to the Commission are calculated by using the accounting procedures currently accepted by the Commission. This procedure, defined as the straight-line method and average life procedure, uses estimated average service lives and salvage values. Through statistical analysis of a large body of data, it is possible to analyze historical experience of groups of property as a basis for estimating average service life. The statistical methods used, actuarial and simulated plant record, as explained below, are acceptable methods used in the determination of service life of industrial and utility properties.

The use of such statistical methods has been made possible through computerization. The compilation of all significant groups of class I railroads is possible using modern data processing technology. The estimation of the most probable survivor curve is based on the appropriate use of statistical techniques augmented by professional judgment.

Although the selected curves do not match exactly, appropriate periods of analysis can provide a proper projection of future service life. This projection can be used to estimate a reasonable level of accrued depreciation which should be accumulated in the accounts. In addition, the estimate of salvage is based on past experience and anticipated recovery on retirement.

ESTIMATES OF AVERAGE SERVICE LIVES

The study of life analysis was primarily concerned with developing more effective methods of determining service lives. The study was also concerned with the application of depreciation rates and the determination of the accrued depreciation account. In such studies, it was recognized that the life of the investment sometimes varied substantially from the physical life of the property. In other words, the life of the dollar investment exceeds the physical life of the property based on betterment accounting. For example, in the grading or fences and signs accounts, the life for accounting purposes may appear unreasonable when compared with the physical or engineering experience associated with the physical life of the property.

We believe the current methods of analysis and synthesis of service lives will result in more accurately relating to the life of the investment. The usual statistical methods used for analyzing the historical lives are the acturial method and the simulated plant record (SPR) method. Both methods are used in this study as explained below. When either method is combined with appropriate engineering judgment, sound indications of the life characteristics should result.

ACTUARIAL METHOD FOR EQUIPMENT

The actuarial method was used for equipment because the data required in this method of analysis was readily available from the equipment property records. A data bank has been created for each railroad's equipment which will require only an update to review on a cyclical basis. To facilitate the actuarial study using the annual rate method, the computations have been computerized. In addition to the basic life table, the program is designed to provide other statistical information to assist in the judgmental process of estimating service life and salvage value. Such information includes a time series of additions and retirements, surviving plant by age (age distribution) and average age of retirements.

The ultimate determination of estimated service life and salvage value to be used for a particular account of an individual company is based on judgment. Criteria for judgment in these instances are specific engineering and operating information concerning the nature and character of the property under review and observed experience.

An estimate of accrued depreciation amount for each of the primary equipment accounts is calculated by using the life expectancy and the average life applicable to the surviving dollars in each vintage (age distribution) adjusted for salvage. An estimate of the reserve ratio for each vintage is generated and applied as of a given date to produce an estimate of the percent of total past accrued depreciation for an account. The estimate derived from this percent is compared to the actual accrued depreciation account balance reported in the annual report to the Commission.

A technical description of the actuarial method may be found in *Statistical Analyses of Industrial Property Retirements* by Robley Winfrey, Bulletin 125, Revised Engineering Research Institute, Iowa State University, Ames, Iowa.

SPR METHOD FOR ROAD PROPERTY

The SPR method was used for road property because the data for aged transactions was not readily available and the information required by this method could be retrieved from property records in a straight-forward manner. The SPR method, which has been widely used for over 20 years, has been shown to yield reasonable historical summaries of the life experience of properties. The result of a study is comparable to the stub curve produced by the actuarial method. The ultimate determination of service life and salvage is based on judgment. Such judgment is derived from the specific engineering and operating information concerning the nature and character of the property under review and observed experience. A technical description of the simulated plant record method may be found in *Method of Estimating Utility Plant Life* produced by the Edison Electric Institute, New York, New York, Publication No. 51-23, published in 1952.

Prior to January 1, 1943, investment in road property was recovered only through retirement accounting, rather than through depreciation accounting. Retirement accounting involves a single charge to expenses at the time property is retired, rather than the series of equal periodic charges to expenses required under straight line depreciation accounting. Depreciation accounting of certain roadway accounts was required by the Commission from January 1, 1943, onward. However, no attempt was made in 1943 to establish accrued depreciation because a reconstruction of the year-by-year accounting activity back to about 1914 would have been required, a laborious and time-consuming task. The SPR method does not require such a laborious reconstruction of accounts to derive a valid estimate of accrued depreciation for any year from the newly compiled computerized 1914-1972 data bank. The new data bank permits the Bureau of Accounts to do statistically what it was unable to do in the early 1940's. As indicated earlier, some parties to Ex Parte No. 271 have contended that the net investment base is overstated due to the absence of an adjustment in the accrued depreciation account to reflect depreciation net accrued prior to January 1, 1943. A determination of this point would now appear to be possible for the roadway accounts through use of the SPR analytical method and the new computerized data bank.

APPENDIX H

Application of depreciation accounting to track structure accounts of the Western Maryland Railway Company

Contents *Page*

I. Highlights ---------- 1744
II. Background ---------- 1744
III. Objective ---------- 1745
IV. Summary of findings ---------- 1745
  1. Rate base
  2. Operating income
  3. Rate of return
  4. Effect on funds flow
  5. Effect on other financial ratios
V. Discussion ---------- 1749
  1. Validity of findings
  2. Depreciation rate for rail
VI. Recommendations ---------- 1750

Application of depreciation accounting to track structure accounts of the Western Maryland Railway Company

RESTATING THE COMPANY'S 1973 AND 1974 ANNUAL REPORTS

I. *Highlights*

A. The application of depreciation accounting to track structures of the Western Maryland Railway Company (Western Maryland) does *not* significantly change its rate base or rate of return:

—The rate base (net transportation property) would increase by about 4 percent.

—Roadway maintenance expenses would have increased by 1.1 percent in 1973 and 8.9 percent in 1974, and after tax effect, net railway operating income would have increased by 0.6 percent in 1973 and decreased by 0.3 percent in 1974.

—The rate of return on net investment in transportation property would have decreased from 4.16 percent to 3.97 percent in 1973 and from 7.84 percent to 7.34 percent in 1974.

B. It is recommended that:

—Further study be pursued to obtain a broader basis for making conclusions.

—Experiment models be selected from those railroads with large amounts of deferred maintenance and those with accelerated replacements.

—The methodology developed in this study be further refined.

II. *Background*

Ex Parte No. 271 raised an issue concerning the effect of depreciation accounting vs. betterment accounting on rate base and rate of return of railroad companies. The Uniform System of Accounts provides that the following track accounts shall be accounted for under the betterment method:

Account	
8	Ties
9	Rails
10	Other track material
11	Ballast
12	Track laying and surfacing

The difference between betterment accounting and depreciation accounting lies in that:

(1) under betterment accounting, no ratable depreciation is taken on track structures, instead, replacements are charged to maintenance expenses and only the portion that represents additions or betterments in quality are capitalized; whereas,

(2) under depreciation accounting, all replacements are capitalized, and depreciation on track structures is charged to expenses.

Witness Nelson, testifying for the General Mills Group, criticized betterment accounting on the grounds that it allows management to "manipulate" earnings by correlating replacement expenses with expected earnings for the period.[1] Nelson also suggests that reduced replacements would result in a reduction of operating capability; yet under betterment accounting this reduced capability may not be reflected in a downward valuation of the rate base. On the other hand, the Special Projects Counsel indicates in his opening statement that no direct evidence of earning manipulations was found.[2] The SPC also suggests that rate base values are better resolved within the confines of the present system of accounts.

III. *Objective*

In response to these discussions, this study was initiated to apply depreciation accounting to tracks of the Western Maryland Railway Company. However, it was not intended to draw a conclusion and settle the controversy based on this study alone. Rather, the objective of this study is to develop methodology of applying depreciation accounting to track structures. This is the first step toward further studies in order to reach a conclusion on a broader basis. The methodology developed will facilitate further empirical studies of the impact of these alternative methods in actual case situations.

In applying depreciation accounting to the Western Maryland Railway Company as a model, the following questions relevant to Ex Parte No. 271 were explored:

(1) whether the application of depreciation accounting to the track structure accounts would cause a higher or lower rate base than betterment accounting;

(2) whether the application of depreciation accounting to these accounts would cause higher or lower operating income than betterment accounting.

Major steps of this study included:

(1) Adjusting the 1973 opening balance of the road property accounts listed above by capitalizing replacements since 1919 and retiring replaced components;

(2) Calculating an accumulated depreciation account balance for these property accounts.

(3) Restating the 1973 opening balance of retained income for the net after-tax effect of steps (1) and (2);

(4) Restating 1973 and 1974 financial statements applying depreciation accounting to track structure accounts.

(See appendix for detailed description for specific methods and assumptions.)

IV. *Summary of findings*

After fully restating Western Maryland's 1973 and 1974 financial statements, to a depreciation basis, the following was determined:

1. *Rate base*

The application of depreciation accounting would increase the net investment in transportation property by about 4 percent in 1973 and 1974.

This is a result of the catchup capitalization less retirements and accrued depreciation since the year of 1919.

---

[1] Verified statement of Robert A. Nelson, Ex Parte No. 271, p. 132.

[2] Opening statement of Special Projects Counsel, Ex Parte No. 271, p. 59, p. 60.

Net investment in transportation property
(in thousands of dollars)

End of the year	Depreciation accounting	Betterment accounting	Net increase	Percentage increase
1973	$145,081	$139,573	$5,508	3.95
1974	139,693	134,346	5,347	3.99

2. *Operating income*

Depreciation accounting would increase Western Maryland's 1973 net railway operating income by $20,000 or 0.6 percent as compared to that reported under betterment accounting. The 1974 net railway operating income would decrease by $29,000 or 0.3 percent.

The effect on operating income depends on whether depreciation accounting would increase or decrease the roadway maintenance expenses. Under betterment accounting, replacements in kind are charged to maintenance expense. But under depreciation accounting replacements in kind are capitalized and a depreciation expense is charged against income. In the case of Western Maryland, depreciation expense on track exceeds the amount of replacements by $71,000, or 1.1 percent in 1973, and $161,000, or 8.91 percent in 1974. This is shown in the following table:

(in thousands of dollars)

Year	Depreciation on track structure	Maintenance capitalized[1]	Reduction in income before taxes	Percent increase
1973	$(1,365)	$1,294	$(71)	1.10
1974	(1,375)	1,214	(161)	8.91

[1] Adjusted for retirements.

Assuming the Internal Revenue Service accepts depreciation methodology, increases in expenses would reduce taxable income and the capitalized replacements would qualify for investment income tax credits. The net effect on income is shown in the following table:

(in thousands of dollars)

Year	Reduction in income before taxes	Reduction in income tax	Investment tax credits	Net increase (decrease) in net income
1973	$(71)	$34	$57	$20
1974	(161)	77	55	(29)

One of the criteria used by financial analysts in measuring the quality of the reported income is its relationship to funds flow. The depreciation or betterment accounting methods do not affect a company's funds flow but they may affect the magnitude of reported net income, and thus the quality of reported income. However, the case of Western Maryland does not help to illustrate this point because, as shown above, a change from betterment accounting to depreciation accounting does not significantly change its net income. The following table shows net income under both betterment and depreciation accounting compared with funds flow:

(in thousands of dollars)

Year	Funds flow[1] surplus (deficit)	Net income - betterment accounting	Net income - depreciation accounting
1973	$5,559	$3,342	$3,362
1974	15,060	10,745	10,716

[1] The term "funds" used here means working capital which is readily convertible into cash.

3. *Rate of return*

"Rate of return" for this report is defined as the ratio of net railroad operating income to net transportation property (gross transportation property less accumulated depreciation). Because of the changes explained above, depreciation accounting would reduce the rate of return insignificantly, as shown by the following:

Rate of return

Year	Betterment accounting	Depreciation accounting
	Percent	*Percent*
1973	4.16	3.97
1974	7.84	7.34

4. *Effect on funds flow*

The application of depreciation accounting does not affect the net funds flow of the company. However, tax savings may accrue if the IRS accepts depreciation accounting for track structure for tax purposes. In the Western Maryland's case, assuming the depreciation method is accepted by IRS, the tax savings are estimated at $91,000 in 1973 and $132,000 in 1974. These amounts represent an increase in funds flow. The following table shows a breakdown of these amounts and their percentage to the net funds flow of Western Maryland in 1973 and 1974:

(in thousands of dollars)

Year	Net funds flow under betterment accounting suplus (deficits)	Depreciation accounting			
		Reduction in income tax	Investment tax credit	Total tax savings	Percent to funds flow
1973	$5,559	$34	$57	$91	1.64
1974	15,060	77	55	132	0.88

Note:

(1) The term "funds" used here means working capital which is readily convertible to cash.

(2) State income tax effect is ignored.

The assumption that the depreciation accounting method saves taxes may be true where a carrier practices deferring maintenance, and where depreciation expense exceeds replacement costs. However, this is not always true. No tax savings can be realized by using depreciation accounting if replacement costs are in excess of depreciation expense, and the tax effect on this excess is greater than the amount of investment tax credits.

5. *Effect on other financial ratios*

The application of depreciation accounting would affect some other financial ratios. These ratios are usually considered for bond ratings and corporate analysis performed by financial analysts. They are also important to the railroads because they are the bases, in many cases, for attracting funds from the private sector. Based on depreciation accounting, a slight increase is revealed in the 1973 and 1974 operating ratios. This is because under depreciation accounting maintenance expense of these 2 years is increased. The analysis also shows a slight decrease in both the debt-equity ratio and the ratio of debt to long-term capitalization (long-term debts plus equity). This is because retained earnings have been adjusted upwards to reflect the net increase in book value of road property caused by capitalizing previously expensed replacements. The income tax effect on this "catch-up" capitalization has been estimated and included in adjusting the retained earnings. The following table compares financial ratios computed under depreciation accounting and betterment accounting:

Financial ratios of Western Maryland

Ratios	Year	Betterment accounting	Depreciation accounting
		Percent	*Percent*
Operating ratio	1973	79.60	79.73
Do	1974	66.81	67.03
Debt-equity ratio	1973	62.71	60.22
Do	1974	65.26	62.38
Debt to long-term capitalization	1973	38.54	37.59
Do	1974	39.49	38.42

(The current ratio will not be affected).

V. *Discussion*

1. *Validity of findings*

The findings summarized indicate that the application of depreciation accounting to track structures of the Western Maryland Railway Company has no significant impact either on rate base or rate of return. The effect on other financial ratios is also negligible. These findings must be evaluated with the characteristics of the company. The most significant characteristics of Western Maryland for the purposes of this study could be summarized as follows:

(1) Economic maturity—Western Maryland has operated for 58 years at a stable level.

(2) Stable operating results—it has consistently earned a profit and has had no cash problems.

(3) Relatively adequate maintenance—our analyses show that the company has kept its trackage nearly adequately maintained, and the company reported no deferred maintenance or delayed capital improvements for road property.

The findings of this study should be valid and applicable to railroads with characteristics similar to these of Western Maryland. A change from betterment accounting to depreciation accounting would not significantly affect the rate base and rate of return of railroads which have been maintaining their roadway property.

However, the findings of this study are insufficient to warrant a conclusion about the propriety of depreciation accounting versus betterment accounting. The Western Maryland Railway Company may be typical for railroads that have maintained their track structures, but it is not typical for railroads with substantial deferred maintenance. Different findings may result if depreciation accounting is applied to these railroads, or railroads which have an accelerated replacement program.

2. *Depreciation rate for rail*

Rail amounts to about 22 percent of the total track accounts affected. The choice of an appropriate depreciation rate for the rail account would affect the results of this study. Railroads using depreciation accounting for tracks have used different rates to depreciate rail. The following are three examples:

Company	*Rail depreciation rate* *Percent*
Canadian Pacific	1.82
CNW (for reporting to stockholders)	2.42
BN lines within the Canadian territory	1.00

In this project, a zero rate was used for rail depreciation because it was projected that the recoverable rail scrap value would be higher than original costs. At the time the methodology was developed, the rail scrap price was $81 per ton which exceeds average original unit costs on the record of Western Maryland. The latest original unit cost computed on a moving average basis was $60.86 per ton in 1974. Based on this information it was projected that the recoverable scrap value would continue to be higher, or at least equal to original costs. This is the reason why a zero depreciation rate was used for the rail account. However, the relationship between original rail costs and scrap prices is not fixed. It is subject to wide fluctuations of the market. If the future trend indicates that the price of new rail is going up faster than scrap price, or the scrap price actually **goes** down, the depreciation rate will have to be adjusted. This means that the depreciation rates should be subject to periodic review and continual research. In future studies the following factors should be considered:

(1) Projections for salvage value should be modified under changing situations. The large scale line abandonments taking place during the reorganization of the Northeast railway system would greatly increase the supply of scrap rail and depress its price. This indicates that the zero rate for rail depreciation may no longer be appropriate.

(2) The economic life of the whole trackage taken as a property unit should be evaluated. Under the methodology used for this study, a service life is determined for each component of the trackage and a depreciation rate is prescribed. An alternative would be to evaluate the useful life of the whole track structure based on its economic function. However, extensive study will be needed to determine the feasibility and reasonableness of this alternative.

VI. *Recommendations*

As stated earlier, the objective of this study is to develop a methodology of applying depreciation accounting to railroad track structures. This objective is basically accomplished, although depreciation rates and reserve ratios need continual review and refinement. Since the Western Maryland Railway Company is not typical for the railroad industry, and the findings are inconclusive to the issue raised in Ex Parte No. 271, the study should be carried further by selecting model railroad companies representing those roads with large amounts of deferred maintenance, or those with accelerated replacements in recent years. Further study of these railroad companies would give more information about the impact of betterment vs. depreciation accounting on railroad rate base and rate of return. This further study would present a broader basis for determining whether a change to depreciation accounting would be desirable.

It is recommended that further research be made to improve or develop new approaches used in restating road property balances. This research should be aimed at simplifying procedures, reducing costs, and still, arriving at reasonable balances. The Commission should continue to review and refine depreciation methods, assumptions, and rates. The appropriety of using a zero rate for rail depreciation has been discussed. This an example of areas where further deliberation is needed. The factors discussed in the preceding section should be considered in determiming depreciation rates.

METHODS AND ASSUMPTIONS FOR THE APPLICATION OF DEPRECIATION ACCOUNTING TO THE WESTERN MARYLAND RAILWAY COMPANY

1. *Capitalization of roadway maintenance*

Under betterment accounting, replacements in kind of track components (accounts 8 to 12) were expensed. Depreciation accounting capitalizes new components and retires old components. We did this reversal for each of the 55 years since 1919 to 1973 to establish 1973 adjusted opening balances for these accounts. In doing so, we made the following assumptions:

Account 8, Ties—the number of ties reported in schedule 513, ties laid in replacement, is capitalized at the cost reported in the schedule; and the same number of ties is retired at a moving annual average cost.

Account 9, Rail—The weight of rail reported in schedule 515, rails laid in replacement, is capitalized at the cost reported in the schedule; and the same weight of rail is retired at an annual moving average cost. No distinction is made between new and relay rails.

Account 10, Other Track Material—The record of property changes was reviewed to collect the dollars applicable to property newly constructed or installed where no other track material existed. For betterments and replacements in kind, no material listing or traceable schedule was available to calculate additions and retirements for these functions through the years. The assumption made in this instance was that other track material bears a direct relationship to account 9, Rail, and this relationship was studied over a period of years to measure the ratio. The study indicated a relatively constant 60-percent ratio of "other track material" to rail over the years. Thus, we assume that amounts of other track material capitalized and retired equal to 60 percent of those for rail.

Account 11, Ballast—Fifty percent of the amount expensed to account 218 (Roadway Maintenance, Ballast) are capitalized, and a 30-year life cycle is used for retirement purposes.

Account 12, Track Laying and Surfacing—Fifty percent of maintenance expense in account 220, Track Laying and Surfacing, is capitalized and retirements are based on composite life characteristics of the other track accounts.

2. *Setting up depreciation allowance*

Total depreciation allowance (or depreciation reserve) for all track structure accounts affected is $24,966,000 for the period from 1919 to the end of 1973. This amount is *not* accrued from annual depreciation provisions. It is derived by applying a "reserve ratio" to each account. The reserve ratios are developed by the "simulated plant record method" of forecasting average service lives. This methodology was explained in detail in an interim report in Ex Parte No. 271, 345 I.C.C. 410. The following are the reserve ratios applied:

		Percent
Account	8 Ties	48
	9 Rail	0
	10 Other Track Material	16.2
	11 Ballast	41
	12 Track Laying and Surfacing	38

As shown above, we applied a zero ratio for rail depreciation allowance. We also used a zero rate to take current depreciation expenses for the rail account. We did so because our analysis indicated that anticipated receipts or disposition of retired rail would be equal to or greater than book value. At the time the depreciation rates for this project were determined, the scrap price was $81 per ton which is higher than any original unit costs recorded by Western Maryland. The highest original unit cost was $60.86 in 1974. We projected that this trend was to continue and thus a zero rate was used. We recognize that the rail scrap price fluctuates widely and our projections for prices in the future should be modified under changing conditions. Based on our statistical analysis, the service life of rail ranges from 24 to 26 years.

3. *Depreciation rates*

Depreciation expenses taken for 1973 and 1974 are computed by applying the following rates to the average of opening and ending balances with the straight-line method:

Account		*Percent*
Account 8	**Ties**	3.33
9	Rail	0
10	Other **Track Material**	2.08
11	Ballast	1.82
12	Track **Laying and** Surfacing	3.23

These rates are determined with the same method as explained in the interim report mentioned above (345 I.C.C. 410).

The salvage value of each account is assumed as follows:

Account	Salvage value
Account 8, Ties	None.
9 **Rail**	Equal or greater than original costs.
10 Other Track Material	50 percent of book value.
11 Ballast	None.
12 Track Laying and Surfacing	None.

For depreciation accounting purposes, property units are based on units defined in Revised Supplement No. 4 to Valuation Order No. 3, effective 1/1/33.

4. *Net adjustment to individual property accounts*

The following table shows adjusted balances of property accounts effected in comparison with balances reported under betterment accounting for the year of 1974:

(in thousands of dollars)

Account	(1) Balance-betterment accounting	(2) Balance-depreciation accounting	(3) Accumulated depreciation on column (2)	Net investment (2) - (3)
No. 8, Ties	$3,455	$10,648	$5,465	5,183
No. 9, Rails	6.769	12,254	0	12,254
No. 10, Other Track Material	6,091	8,858	1,736	7,122
No. 11, Ballast	3,960	5,816	2,542	3,274
No. 12, Track Laying and Surfacing	3,918	17,292	7,070	10,222

APPENDIX I

Listing of class I line-haul railroads,
by district, included in study data base

Eastern District, less bankrupts

Akron, Canton & Youngstown RR	(ACY)
Baltimore & Ohio RR Co.	(BO)
Bangor & Aroostook RR Co.	(BAR)
Bessemer & Lake Erie RR Co.	(BLE)
Canadian Pacific Lines in Maine	(CP)
Central Vermont Ry., Inc.	(CV)
Chesapeake & Ohio Ry. Co.	(CO)
Chicago & Eastern Illinois RR	(CEI)
Chicago & Ill. Midland Ry Co.	(CIM)*
Delaware & Hudson Ry. Co.	(DH)
Detroit & Toledo Shore Line RR	(DTS)
Detroit, Toledo & Ironton RR C	(DTI)
Elgin, Joliet & Eastern Ry. Co.	(EJE)
Grand Trunk Western RR Co.	(GTW)
Illinois Terminal RR Co.	(ITC)
Lehigh & Hudson River Ry Co.	(LHR)*
Long Island RR Co.	(LI)
Maine Central RR Co.	(MEC)
Missouri-Illinois RR Co.	(MI)
Monongahela Ry. Co.	(MGA)
New York Susquehana & Western	(NSW)*
New York, Chicago & St. Louis	(NCS)*
Norfolk & Western Ry. Co.	(NW)
Pennsylvania-Reading Seashore	(PRS)
Pittsburgh & Lake Erie RR Co.	(PLE)
Richmond, Fredericksburg & Pot	(RFP)
Rutland Ry. Corp.	(RUT)*
Staten Is. Rapid Transit Ry.	(SIR)*
Wabash RR Co.	(WAB)*
Western Maryland Ry. Co.	(WM)

---

*Railroads which have merged to form new roads existing in 1974, or have been reclassified.

Southern District

Alabama Great Southern RR Co.	(AGS)
Alabama, Tenn., & Northern	(ATN)*
Atlanta & West Point RR Co.	(AWP)
Atlanta & St. Andrew Bay RR	(AAB)*
Atlantic Coast Line RR Co.	(ACL)*
Carolina & Northwestern Ry Co.	(CNR)*
Central of Georgia Ry. Co.	(CGA)
Cincinnati, New Orleans & Texas	(CNTP)

See note at end of chart.

Clinchfield RR Co.	(CCO)
Florida East Coast Ry. Co.	(FEC)
Georgia & Florida Ry. Co	(GFR)*
Georgia RR, Lessee Organization	(GA)
Georgia Southern & Florida Ry.	(GSF)
Gulf Mobil and Ohio RR Co.	(GMO)
Illinois Central Gulf RR Co.	(ICG)
Louisville & Nashville RR Co.	(LN)
Monon RR	(MON)*
New Orleans & Northeast, RR	(NON)*
Norfolk Southern Ry. Co.	(NS)
Piedmont & Northern Ry. Co.	(PMN)*
Pittsburg & West Virginia Ry.	(PWV)*
Savannah & Atlanta Ry. Co.	(SAR)*
Seaboard Air Lines RR Co.	(SAL)*
Seaboard Coast Line RR Co.	(SCL)
Southern Ry. Co.	(SOU)
Tennessee Central Ry. Co.	(TCR)*
Western Ry. of Alabama	(WRA)

Western District, less: Rock Island

Atchison, Topeka & Santa Fe Ry	(ATSF)
Burlington Northern Inc.	(BN)
Chicago, Burlington & Quincy RR	(CBQ)*
Colorado & Wyoming Ry. Co.	(CWR)*
Colorado & Southern Ry. Co.	(CS)
Denver & Rio Grande Western RR	(DRGW)
Duluth, Missabe & Iron Range R	(DMIR)
Duluth, Winnipeg & Pacific Ry.	(DWP)
Fort Worth & Denver Ry. Co.	(FWD)
Great Northern Ry. Co.	(GN)*
Green Bay & Western RR	(GBW)
Kansas City Southern Ry. Co.	(KCS)
Kansas Oklahoma, Gulf Ry. Co.	(KOG)*
Lake Superior & Ishpeming RR Co.	(LSI)
Louisiana & Arkansas Ry. Co.	(LA)*
Minneapolis, Northfield & Sout	(MNS)
Missouri Pacific RR Co.	(MP)
Northern Pacific RR Co.	(NP)*
Northwestern Pacific RR Co.	(NWP)
Oregon Electric Rwy. Co.	(OE)
Pacific Electric Ry. Co.	(PER)*
Quanah, Acme & Pacific Ry.	(QAP)*
San Diago & Arizona Eastern Ry.	(SDA)*
Soo Line RR Co.	(Soo)
Southern Pacific Transportation	(SP)
Spokane International	(SI)
Spokane Portland, Seattle Ry Co.	(SPS)*

See note at end of chart.

St. Louis, San Fran & Texas Ry.	(SST)*
St. Louis Southwestern Ry. Co.	(SSW)
St. Louis-San Francisco Ry. Co	(SLSF)
Texas & Pacific Ry. Co.	(TP)
Texas Mexican Ry. Co.	(TM)
Toledo, Peoria & Western RR Co	(TPW)
Union Pacific RR Co.—System	(UP)
Western Pacific RR Co.	(WP)

---

*Railroads no longer in existence or existing under new name

APPENDIX J

Table of contents

Forecast premises and methodologies

Forecast Methodology No.	Forecast Methodology	Page
1	Traffic projections	1756
2	Revenue projections	1767
3	Operating expense projections	1775
4A	Equipment expenditure projection	1803
4B	Roadway facility expenditures	1835
5	Track structure additions and betterments and credits for track retired	1844
6	Retirement schedule of existing debt	1845
7	Existing leases (attrition projections)	1851
8	Depreciation concepts and procedures	1851
9	Rent income and rent payable excluding freight car leases	1856
10	Schedule of new debt	1876
11	Working capital projections	1882
12	Projected interest expense	1884
13	Rent for leased roads & equipment	1897
14	New equipment leases	1897
15	Railway tax accruals	1903
16	Common and preferred stock dividends	1911
17	Minor accounts 1) Other income 2) Miscellaneous deductions 3) Extraordinary and prior period items 4) Special funds 5) Investment in securities 6) Miscellaneous property 7) Other assets and deferred charges 8) Reserves 9) Other liabilities and deferred credits 10) Capital stock 11) Capital surplus	1917

Forecast premises and methodologies—Continued

Forecast Methodology No.	Forecast Methodology	Page
18	Net investment base projections	1927
19	Financial ratio computations	1932
20	Short-term model	1936

Forecast Methodology No. 1

TRAFFIC PROJECTIONS

This section provides a description of the scope and methodology of the rail traffic projections underlying the projected funds flow model.

I—1985 GNP estimates

A. *1985 GNP growth projections.*—A close relationship between rail traffic demand and economic activity has long been recognized, and it is this linkage in particular that makes the target year estimates of the Gross National Product (GNP) level a prerequisite to the procedure of projecting future rail traffic demand. Since transportation demand is derived from demand for the commodity by consumers, it is essential that this relationship be measured and analyzed in depth, as part of a thorough projection effort. This is necessary, since the quality and reliability of future traffic estimates depend very heavily on the extent to which this connection has been developed and demonstrated.

This particular demand model stresses the structural changes in the economy and its sectors as the major determinants of rail freight demand over a period of time. Consequently, aspects of intermodal competition—or generally the impacts on demand of changes in rates or service—are not explicitly isolated and "explained" here; nonetheless, they are implicit in the model structure via the various trend variables contained in the demand equations.

Selection of the GNP series is a crucial step, but only the beginning. Industrial growth rates need to be estimated and analyzed, especially for those commodity groups that rely heavily on rail transportation. These are discussed later in this forecast methodology.

In extending to 10 years, the projections of the economy on which the traffic projections are based give prime consideration to factors underlying long-term economic growth, such as the labor force, productivity, and technological change. In the short-term range of the forecast—i.e., in the first year or two—current and expected cyclical conditions come into play to improve the accuracy of the forecast. Though the precise course business cycles will take beyond that short range period is highly uncertain, a sequence of cycles typical of the U.S. economy in recent times has been assumed in order to inject more realism into the portrayal of how the rail industry's financial condition can be expected to change over the coming years.

During the actual selection phase, several alternative GNP estimates were considered and their methodologies reviewed. Several of these estimates are briefly discussed below:

1. The *BLS* forecast[1] projects an annual average growth rate of 3.9 percent of real GNP between 1975 and 1980. This is a downward revision of an earlier estimate of 4.1 percent made in 1970. This revision was undertaken because of the expected lower productivity gains during the latter half of the 1970's, especially in the "service" sectors, brought about principally by increased part-time workers and higher participation rates of female workers.

2. The GNP estimates by Data Resources, Inc. (DRI), for 1980 and 1985 in constant 1958 dollars are 988.6 and 124.0 billion, respectively. Although these estimates are slightly optimistic, they do provide us with a plausible alternative compared to other projections.

3. A less optimistic projection of the GNP growth rate to 1980 and 1985 was reported by *INFORUM*, the Interindustry Economic Research Project of the University of Maryland under the direction of Dr. Clopper Almon, Jr. His report[2] predicts a great slowdown of the American economy beginning in the latter half of the 1970's and further stagnation during the 1980's. The following table 1-1 shows the aggregate anticipated growth rates of GNP, labor force and productivity variables:

Table 1-1.—Aggregate growth rates in percent per year.

	1961-69	1969-73	1973-75	1975-80	1980-85
GNP (real) ------------	4.6	3.7	3.1	2.8	2.2
Labor force -----------	2.1	1.8	1.7	1.6	1.1
GNP/employed person.	2.2	1.9	1.1	1.2	1.0

According to Dr. Almon, the extremely low 2.8-percent annual average growth rate of GNP (real) between 1975 and 1980 is principally due to three sources of expected economic retardation:

a. a slowdown in the growth rate of the labor force,

b. a greater shift of employment into sectors with low productivity growth, and

c. a decline of productivity growth rates in individual sectors, especially the service industries.

4. The McGraw-Hill GNP projections, as well as those of Wharton Econometrics, were also reviewed.

After reviewing the various models and their assumptions, the Coordinator calculated $952.3 and $1,077.0 billion to be reasonable estimates of 1980 and 1985 GNP (1958 dollars). They reflect a significant downward revision from earlier estimates. This somewhat more pessimistic outlook stems from the recent information regarding the dismal performance of the economy during 1974 and 1975, an anticipated inflation—recession cycle in 1977/1978 and the moderate performance expected in the 1980's. Because of cyclical considerations, a more realistic assumption was incorporated into the model, that of a recession in the 1983/1984 period. This 1983/84 downturn reflects the anticipated decline in the growth of the labor force, and the slow downward drift of productivity or output per man-hour.

---

[1] U.S. Department of Labor, Monthly Labor Review, December 1973.

[2] Clopper Almon, et al., 1985: *Interindustry Forecasts of the American Economy, Lexington, Mass., D.C. Heath & Co., 1974, pp. 12-21.*

Agriculture and mining are expected to continue declining, while manufacturing is expected to hold the 27- to 29-percent share of output it has had in the past. A further expansion of the service sector is expected, but with a projected decline in the retail and wholesale trade sector share of total output.

Table 1-2 shows the actual and expected GNP estimates between 1972 and 1985:

Table 1-2—1972-1985 GNP projections
(billions of 1958 dollars)

Year	GNP	Annual growth rate
		Percent
1972	792.5	
1973	839.2	5.90
1974	821.2	-2.15
1975	783.6	-4.58
1976	852.7	8.82
1977	891.0	4.49
1978	882.2	-.99
1979	913.0	3.49
1980	952.3	4.3
1981	998.9	4.89
1982	1037.0	3.81
1983	1075.0	3.66
1984	1041.0	-3.17
1985	1077.0	3.45

B. *1985 outlook by industry.*—The 1980 and 1985 GNP estimating procedure was followed by an industry breakdown of these estimates. Among others, this has been done by DRI, BLS, Jack Faucett Associates, and Dr. Clopper Almon at the University of Maryland. For purposes of the funds flow model, the DRI "control long" model's production indices were chosen, since they represented the most recent estimates (as of October 1975) of total output and provided a comparable historical time series which greatly facilitated the regression analysis procedure.

The expected economic activity for selected major industries is shown in table 1-3. As one can readily see, the highest growth rates between 1973 and 1985 are expected in three major sectors: chemicals, metallic ores, and pulp and paper products. This upward trend is for the most part reflected in the rail traffic increases for the respective commodities, as shown in table 1-8.

Table 1-3.—Commodity output projections

Commodity group	DRI[1] series symbol	1973 value	1985 value
Farm products	JFRB352	1.254	1.825
Metallic ores	JFRB10	1.310	2.027
Coal	JFRBMI	1.103	1.436
Nonmetallic materials	JFRB14	1.094	N/A
Food and kindred	JFRB20	1.225	1.755
Lumber products	JFRB24	1.276	1.796
Pulp & paper products	JFRB26	1.351	2.305
Chemicals & fertilizers	JFRB28	1.504	3.245
Stone, clay & glass	JFRB32	1.297	1.519
Primary metals	JFRB33	1.265	1.785
Transportation equipment	JFRB37	1.090	1.436

[1] These series are actually FRB production indices that correspond closest to the commodity groups and are numbered accordingly. JFRB14 was not available in the "Control Long 10/75" model published by Data Resources, Incorporated.

On the other hand, only relatively small gains are expected in the primary metal and food industries, possibly the result of the higher expected cost of living during the remainder of the 1970's and early 1980's. This is particularly a factor in the food industry, where both substitution and income are expected to limit its growth over this time period.

It should be noted, however, that DRI's indices projections have been adjusted to correspond to the Commission's model assumptions prior to being used in the derivation of the rail traffic projections. Therefore, certain rail traffic projections may appear to vary significantly from what one may expect from simply viewing Table 1-3. Metallic ore is a prime example of this particular adjustment procedure.

II—Freight traffic projections to 1985

A. *U.S. total tons originated by commodity group.*—Tonnage originated by major commodity group (U.S. total) was projected to 1985, based on the estimating technique of least squares. To improve the "goodness of the fit" of the equations over simple regression equations using GNP or a time factor as the sole explanatory variable of rail commodity traffic, the main explanatory variables chosen were the total output values from the DRI production indices shown in table 1-3. The period for which observations were gathered covered 17 years (1958-1974) for total traffic U.S., and 10 years (1964-1973) for the commodity equations.

The data were fitted to several types of equations on a total traffic level, such as, (a) simple, linear; (b) multiple, linear; (c) multiple, semilog; and (d) multiple, log-log. The multiple linear regression model was finally chosen, and yielded the highest R^2 (multiple coefficient of determination) and highly significant F statistics.

The equation below shows the type of mathematical relationship used in this analysis; for example, the equation for chemicals and chemical products (STCC-28) traffic for the U.S. (tons originating) was estimated in the following relationships:

$$\begin{array}{lll} T_{28\text{-}0} = & 36.2101 & + \ 43.9321 \ (\text{JFRB28}) \\ & (9.05) & \quad (12.5) \\ & (4.00)^{*} & \quad (3.51)^{*} \\ & & R^2 = .9453 \\ & & n \ = 10 \end{array}$$

$T_{28\text{-}0}$ = millions of tons originating in U.S. for commodity STCC-28.
JFRBj - FRB production index for commodity group j.
R^2 = multiple coefficient of determination
( ) = t - statistic for coefficient
( )* = standard error of the regression

The equation above shows the results of the regression. The values in parentheses below the regression coefficients represent the standard errors and their associated t-values which indicate the degree of significance of each variable. Furthermore, for the purpose of clarification, table 1-4 shows the R^2 results for each of the equations used in the analysis.

Table 1-4.—Regression results: multiple coefficient of determination (R^2)

Commodity-tons originating—US	R^2
Farm products	.2360
Metallic ores	.31
Nonmetallic materials	--------------
Food and kindred	.6550
Lumber products	.8988
Pulp & paper products	.9244
Chemicals & fertilizers	.9453
Stone, clay & glass	.6384
Primary metals	.5433
Transportation equipment	.4795
Total tons originating	.942
Total ton-miles	.96

B. *Commodity traffic estimates—U.S. Total.*—Table 1-5 shows 1985 traffic estimates by commodity group and total traffic for the United States. Annual projections for 1975-85 are shown in table 1-8.

Table 1-5.—U.S. total originating traffic commodity projections (millions of tons)

Commodity	STCC	compound annual growth rate 1973-1985	1985	1973
		Percent		
Farm products	01	.82	172.3	156.1
Metallic ores	10	1.17	143.9	125.1
Coal	11	4.62	646.1	375.7

Table 1-5.—U.S. total originating traffic commodity projections (millions of tons)—Continued

Commodity	STCC	compound annual growth rate 1973-1985	1985	1973
		Percent		
Nonmetallic minerals	14	1.2	196.2	170.0
Food	20	1.78	131.2	106.1
Lumber	24	1.07	122.3	107.6
Pulp and paper products	26	3.37	67.5	45.3
Chemicals	28	3.35	148.2	99.7
Stone, clay & glass	32	.03	72.9	72.6
Primary metals	33	1.48	85.2	71.4
Transportation equipment	37	2.09	44.0	34.3
Total traffic	----------------	2.23	1998.0	1532.2

The highest U.S. compound growth rate (4.62 percent) is expected for coal traffic, due primarily to the enormous increase in the production of western coal. In addition to coal, considerable growth of chemicals and pulp and paper products traffic is expected, stemming largely from high anticipated production levels in these industries. The total U.S. compound growth rate for all traffic is projected to be 2.23 percent, with the western district providing the strongest support. As can be seen from table 1-5, coal traffic is to be responsible for over 58 percent of the additional tonnage between 1973 and 1985.

C. *Ton-mile traffic projections.*—Ton-mile traffic projections can be found in table 1-7. Here the estimates of increase are somewhat higher than for originating tons; however, the pattern of continued eastern stagnation is clearly present, along with a continued increase in the average length of haul. The 1975-1985 ton-mile freight traffic projections for the U.S. and the districts are again based on multiple regression analysis. A multiple regression technique using GNP and coal production as the independent variables became the primary basis of the projections only after several different single and multiple regressions were tried.

In the determination of which of the multiple regressions to use, a number of independent variables were tested. There is no doubt that the use of several independent variables, such as coal, wheat, iron ore, sand and gravel, and transportation equipment production, along with GNP, would have improved the model, but the difficulty is that future production estimates are necessary on a regional basis and most are not available. Coal production data and projections were available, and it was found that a multiple regression using national coal production and real GNP as independent variables provided an excellent fit for the U.S. and the districts.

Table 1-6.—U.S. ton-mile traffic projections—1972-1985

Year	Ton-mile estimates (billions)	Annual growth rate (percent)
1972	776.6	
1973	851.8	9.68
1974	847.6	-.49
1975	754.9 p	-10.94
1976	812.0	7.56
1977	876.1	7.89
1978	901.0	2.84
1979	931.1	3.34
1980	989.3	6.25
1981	1,039.0	5.02
1982	1,080.0	3.95
1983	1,121.0	3.80
1984	1,088.0	-2.94
1985	1,130.0	3.86

p—Preliminary figure.

Table 1-6 shows the actual and estimated ton-miles for the U.S. for the years 1972 through 1985. The estimates through 1975 are actual reported data. The equations used were as follows:

1. *U.S.*

```
    TM--O = 150.801 + .577279 x GNP58
            (3.6)     (3.65)
            (41)*     ( .13)*
+ 0.341308 x USCOAL
    (1.5)
    (.22)*
             R2 = .9663
             n  = 17
```

2. *East*

```
    TM--E = 62.5404 + 0.176137 x GNP58
            (1.7)       (.79)
            (35)*       (.22)*
+ 0.473521 x USCOAL - 8.861 x TIME
    (3.3)*              (-1.75)
    (.14)*               (5.0)*
             R2 = .6415
             n  = 17
```

3. *West*

```
    TM--W = 63.0826 + 0.590662 x GNP58
            (2.5)       (7.24)
            (25)*       (.08)*
- 0.208938 x USCOAL
    (-1.49)
    (.14)*
             R2 = .9663
             n  = 17
```

4. *South*

```
    TM--S = 18.3404 + 0.165895 x GNP58
           (-3.6)       (10.14)
           ( 5.1)*      (.01)
+ .063375 x USCOAL
   (2.25)
   ( .03)*
            R2 = .9923
            n  = 17
```

TM--0 = billions of ton-miles--US
TM--E = billions of ton-miles--East
TM--W = billions of ton-miles--West
TM--S = billions of ton-miles--South
n = number of observations
R^2 = coefficient of determination
GNP58 = GNP in constant 1958 dollars (billions)
( ) = T-statistic for coefficient
( )* = Standard error of the regression

A regression analysis procedure on the "bankrupt seven's traffic" history was used to formulate the projections. The same was done for the eastern district and the eastern nonbankrupt railroads, as a test of the accuracy of the "bankrupt" projections. The projections, however, do not presuppose any particular structural changes that ConRail may introduce into the area.

The negative coefficient for U.S. coal in the equation for the western district can be explained by the fact that past fluctuations in rail movements coincided with opposite fluctuations in the production of U.S. coal. The fast growth pace of western rail traffic is due primarily to GNP growth and is not significantly affected by U.S. coal production. The t-statistics support this relationship. However, this depicted relationship of the past 17 years is not expected to continue unchanged. An, as of yet, insignificant amount of western coal has been produced relative to what is expected; but the industry should boom during the next decade and have a large impact on western rail movements. To account for this structural change in coal production, adjustments to the equation were made such that the western rail movements would reflect the positive effects associated with a boom in western coal production.

TABLE NO. 1-7

Annual ton-mile projections by region for 1973-1985

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
GNP58	839.2	821.2	783.6	852.7	891.0	882.2	913.0	952.3	998.9	1037.0	1075.0	1041.0	1077.0
ATMUS	851.8	855.4	754.9	812.0	876.1	901.0	931.1	989.3	1039.0	1080.0	1121.0	1088.0	1130.0
INDUS	100.0	100.4	88.62	95.33	102.9	105.8	109.3	116.1	122.0	126.8	131.6	127.7	132.7
ATMEAST	245.0	247.8	218.2	225.3	239.0	241.4	248.2	261.3	273.6	279.1	284.1	269.9	275.3
INDEAST	100.0	101.1	89.06	91.96	97.55	98.53	101.3	106.7	112.4	113.9	116.0	110.2	112.4
ATMSOUTH	157.8	160.8	140.3	152.3	164.5	168.4	173.6	184.2	193.2	200.5	206.9	200.6	208.6
INDSOUTH	100.0	101.9	88.91	96.51	104.2	106.7	110.0	116.7	122.4	127.1	131.1	127.1	132.2
ATMWEST	448.9	444.5	396.4	434.4	472.6	491.2	509.3	543.8	572.4	600.4	630.0	617.5	646.1
INDWEST	100.0	99.02	88.30	96.77	105.3	109.4	113.5	121.1	127.5	133.7	140.3	137.6	143.9
ATMBR7	111.3	111.7	97.0	100.3	104.1	102.1	104.2	107.7	112.2	113.1	114.2	107.3	109.8
ATMRI	21.80	19.70	15.40	19.10	19.70	19.30	19.60	20.30	20.80	21.20	21.60	20.70	21.10

Figures for 1973 to 1975 are actual, reported. All others are projected. The symbols are represented as follows:

GNP58—Gross National Product in billions of 1958 dollars.
ATMUS—Annual ton-miles for the U.S. in billions.
ATMEAST—Annual ton-miles for the eastern district in billions.
ATMSOUTH—Annual ton-miles for the southern district in billions.
ATMWEST—Annual ton-miles for the western district in billions.
ATMBR7—Annual ton-miles for the seven bankrupt eastern railroads in billions.
ATMRI—Annual ton-miles for the Rock Island in billions "IND—" series are indices of the rail traffic with 1973 representing base year.

Table No. 1-8

Annual projections of tons originating in US for 1973-1985

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
STCC01	156.1	142.8	125.7	137.0	145.8	147.6	152.4	156.8	159.2	164.6	169.3	169.3	172.3
STCC10	125.1	126.5	119.7	125.7	128.9	126.7	129.4	133.3	135.1	36.1	139.9	139.9	143.9
STCC11	375.7	390.8	394.9	430.4	458.0	473.9	490.0	518.1	538.2	563.5	589.5	617.5	646.1
STCC14	170.0	171.0	166.2	170.0	170.2	163.5	166.0	171.9	180.1	187.4	190.8	187.4	196.2
STCC20	106.1	107.3	96.60	103.4	107.3	107.8	111.0	115.0	120.7	125.4	127.7	127.7	131.2
STCC24	107.6	105.3	97.60	104.4	110.3	110.8	111.2	119.1	119.3	120.3	121.5	120.3	122.3
STCC26	45.30	48.20	42.50	45.90	49.30	49.40	51.30	54.40	58.80	60.40	63.10	64.20	67.50
STCC28	99.70	101.4	92.40	101.5	109.9	112.0	116.9	126.9	132.0	138.3	142.1	143.4	148.2
STCC32	72.60	68.00	58.00	62.60	66.10	66.90	66.60	74.10	74.80	75.00	74.10	71.90	72.90
STCC33	71.40	70.30	58.90	65.40	70.70	70.80	69.40	73.80	76.80	79.70	82.10	82.10	85.20
STCC37	34.30	29.80	27.30	30.80	33.80	34.90	36.90	40.50	41.30	42.10	52.50	41.70	44.00
Tons	1532.	1530.	1432.	1523.	1598.	1607.	1659.	1735.	1804.	1867.	1931.	1931.	1998.
INDTONS	100.0	99.89	93.48	99.43	104.4	104.9	108.3	113.3	117.8	121.9	126.1	126.0	130.4

Figures for 1973 and 1974 are actual, reported; all others are projected. The symbols are represented as follows:

STCC01—Millions of tons of farm products-01.
STCC10—Millions of tons of metallic ores-10.
STCC11—Millions of tons of coal-11.
STCC14—Millions of tons of nonmetallic materials-14.
STCC20—Millions of tons of food and kindred-20.
STCC24—Millions of tons of lumber products-24.
STCC26—Millions of tons of pulp and paper products-26.
STCC28—Millions of tons of chemicals and fertilizers-28.
STCC32—Millions of tons of stone, clay and glass-32.
STCC33—Millions of tons of primary metals-33.
STCC37—Millions of tons of transportation equipment-37.
Tons—Total tons originating (in millions).
INDTONS—Traffic index for Tons with 1973=100.0.

Forecast Methodology No. 2

REVENUE PROJECTIONS

Freight revenue is by far the predominant component of total operating revenue. For this reason the operating revenue projections are computed as ratios to freight revenue based on the 1971-74 experience for each of the railroad groups.[3] The starting point of the freight revenue projections are the ton-mile projections discussed in Forecast Methodology No. 1. Since the linkage sought between the traffic and revenue projections is revenue per ton-mile, it is on this factor that the effort is centered.

In order to have the capability to revise both revenues and expenses in tandem with respect to changes in assumed inflation rates, it was deemed essential to begin with projected revenue per ton-mile on a constant dollar basis (i.e., assuming that there is no inflation, hence no application of general freight rate increases), then to develop a relationship between changes in revenue level and changes in an indicator of cost inflation. A constant dollar revenue per ton-mile is not necessarily a stable figure throughout the forecast period. Even though there are no inflation adjustments, there are continuing, long-term trends in commodity mix, length of haul and loading per car for each commodity, and in the percentage of multiple-car shipments—to mention the more significant ones—that tend on balance to reduce revenue per ton-mile. Even assuming no changes in rate structure, so long as traffic characteristics continue to change according to secular trends, the existing rate structure will produce declining revenues per ton-mile over a period of time, given no general rate increases.[4]

It is important to measure this declining pattern since these same trends affect the course of projected operating expenses. Errors in measuring the impact of these factors on revenues result in projected revenue/expense relationships that are distorted. In order to reduce the risk of incurring serious errors of this sort, two independent approaches were followed to projecting constant dollar revenue per ton-mile for each railroad group.

One approach tried and finally rejected relied on the new Bureau of Labor Statistics (BLS) rail freight price index (monthly from 1969 by major commodity group but not by territorial movement). By deflating revenue per ton-mile for each group from 1969 to 1974 a series is obtained to which time trend equations can be fitted by regression analysis. The period of observations, however, is admittedly too short to be reliable for 10-year projections. Indeed, the projected trends by this approach were found to be too sharply declining relative to expenses and it appears that, for purposes of the funds flow model, the BLS index may be overdeflating the revenue per ton-mile series.[5] Moreover, use of the U.S. aggregate index does not recognize the differences in authorized increases between railroad regions since 1969. Again, the index is not available broken down by region. The advantages of this approach are (1) simplicity of application, and (2) given no serious bias in deflating with the BLS index, better reflection of secular trends in traffic characteristics peculiar to each railroad group.

---

[3] The ratios are as follows for the respective railroad groups: East less bankrupts and ConRail—1.093, South—1.042, and West less R.I.—1.047.

[4] This effect is brought about by the fact that, generally, rail rate structures exhibit a "tapering" with distance, provide for lower rate scales at higher minimum weight, et cetera.

[5] The index follows very closely the authorized general increases since 1969 and appears not to reflect sufficiently—for purposes of the model—exceptions or other factors that would tend to make actual rate increases diverge from those authorized.

The alternative approach chosen was to measure directly the impact of the principal factors considered to be affecting constant dollar revenue per ton-mile over a period of time. This was done by relying on the results obtained in a study done under contract with the Commission in 1973 in connection with the investigation in Ex Parte No. 270.[6] The study applied regression analysis to data from the ICC carload waybill samples for 1966 and 1969 to obtain the relationships by commodity and territorial movement of rates to distance, loading per car, and other traffic characteristics.

This alternative approach is explained in more detail in the following section, after which the procedures for inflating revenues are explained. A clear advantage of this approach is the capability to change the impact of important traffic characteristics on rates in accordance with new information about these characteristics or about the rate structure itself. The prime disadvantage is that all railroad groups are assumed to follow the same pattern after 1975.

Projection of constant dollar freight revenue.—The methodology decided upon to project constant dollar freight revenue was that of projecting revenue per ton-mile and using these results in conjunction with ton-mile projections to obtain revenue projections. Revenue per ton-mile is most heavily influenced by the length of haul[7] and the size of carload.[8] Therefore, an index which reflects these influences is needed in order to produce a reliable revenue per ton-mile projection.

Tons per car and miles per ton were projected for each of 11 major commodity groups[9] using regression analysis, which worked well with the exception of miles per ton for metallic ores, coal, lumber, paper, and primary metals. The regressions used follow.

Tons/car (01) = 41.667 + 2.153 (time*) $r^2 = .986$
Tons/car (10) = 72.993 + .839 (time) $r^2 = .913$
Tons/car (11) = 63.547 + 1.797 (time) $r^2 = .996$
Tons/car (14) = 67.140 + .956 (time) $r^2 = .928$
Tons/car (20) = 32.307 + 1.162 (time) $r^2 = .997$
Tons/car (24) = 40.993 + 1.141 (time) $r^2 = .982$
Tons/car (26) = 30.347 + .772 (time) $r^2 = .985$
Tons/car (28) = 43.080 + 2.191 (time) $r^2 = .994$
Tons/car (32) = 51.113 + .967 (time) $r^2 = .951$
Tons/car (33) = 47.153 + 1.510 (time) $r^2 = .893$
Tons/car (37) = 20.287 + .3497 (time) $r^2 = .801$
Miles/ton (01) = 433.572 + 10.664 (time) $r^2 = .536$
Miles/ton (14) = 151.925 + 2.369 (time) $r^2 = .755$
Miles/ton (20) = 668.167 + 2.774 (time) $r^2 = .698$
Miles/ton (28) = 613.122 + 4.525 (time) $r^2 = .883$
Miles/ton (32) = 351.219 + 4.958 (time) $r^2 = .737$
Miles/ton (37) = 706.765 + 5.529 (time) $r^2 = .763$

*where 1964 = 1

---

[6] RMC Research Corporation, *The Structure of Railroad Freight Rates*, discussed in appendix B of Ex Parte No. 270, *Investigation of Railroad Freight Rate Structure*, 345 I.C.C. 1 (1973), pp. 19-25.

[7] Data source is 1 percent Waybill Sample for 1964, 1965, 1966, 1969, 1972, and 1973 (U.S. to U.S.).

[8] Data source is I.C.C. Class I Railroad Freight Commodity Statistics 1964-1973.

[9] The eleven major commodity groups with their respective STCC codes are 01 Farm Products, 10 Metallic Ores, 11 Coal, 14 Non-Metallic Minerals, 20 Food, 24 Lumber, 26 Paper, 28 Chemicals, 32 Stone-Clay, 33 Primary Metals, and 37 Transportation Equipment.

The length of haul in the remaining five groups was static and it was decided to base the projection on the mean of the observations in each group.

Next the tons-per-car series and the miles-per-ton series were transformed to indices (base 1975), and an elasticity factor (see table 2-1 for each) was applied, resulting in two indices for revenue per ton-mile: one relfecting the influence of tons per car (see table 2-2) and the other reflecting the influence of miles per ton (see table 2-3). The 1975 revenue per ton-mile[10] was multiplied by each consecutively and the resulting figures weighted according to commodity mix[11] for each year.

This series was transformed into an index (base 1975), which resulted in a final index reflecting the influence on revenue per ton-mile of both tons per car and miles per ton (see table 2-4). This adjustment factor was applied to the 1975 revenue per ton-mile for each of the three railway groups, producing a revenue per ton-mile figure for the projected years (see table 2-5). Multiplying by the respective ton-mile projections, a constant dollar (base 1975) freight revenue for each railway group was obtained.

Conversion to inflated dollar freight revenues.—In an effort to relate general freight increases to prices and wages, the following equation was used:

$$r_t = a\{ \kappa\ (P_t) + (1-\kappa)\ (P_{t-1})\} \text{ where}$$

r is the rate of increase for the year t

κ represents the lag in years[12]

P_t is the percent increase in the AAR (Association of American Railroads) combined index of wages and material prices for the year t

P_{t-1} is the percent increase in the AAR wage and material prices for the year t-1

a is a constant

See table 2-6 for the projected revenue inflator and underlying computations, including the projected wage and material prices index.

In using historical data to solve for a certain adjustments were made to deduct what were evidently the portions of the authorized increases that were granted especially to provide for capital investment and deferred maintenance needs. In November 1970, under Ex Parte No. 267, an increase of 7.4 percent was authorized, and in April 1971, a 4-percent increase was authorized, again under Ex Parte No. 267. The 1971 rate increase was adjusted by a decrease of 8 percent. In June 1974, a 9-percent increase was authorized under Ex Parte No. 305. The 1974 rate increase was adjusted by a decrease of 3.5 percent. Thus, the freight revenue projections permit an evaluation of the extent to which the Commission's policy in ordinary general increase cases to cover noncapital items may fall short of providing for capital needs.

---

[10] Revenue per ton-mile by commodity was derived from U.S. Department of Transportation. *Carload Waybill Statistics* Statement TD-1 for 1975.

[11] Projected commodity mix is computed from the projections of tons originated (broken down by the foregoing two-digit groups) discussed in Forecast Methodology No. 1.

[12] Starting from the assumption that the timelags between actual increases in wages and prices and the effective dates of general revenue increases authorized to cover them are less than 1 year, we let κ be a fraction representing the proportion of the current year's increase in wages and prices that is accounted for by the general revenue increase in question; $(1-\kappa)$ then is the proportion of the previous year's increase in wages and prices accounted for. Thus, if there is an 8-month lag (as was finally settled on), on the average a general revenue increase will only reflect one-third of the current year's increase in wages and prices and two-thirds of the previous year's.

Using the adjusted rate increases, a was found in the above equation for the previous 6 years (1969 through 1974), using values for κ varying from 2/12 to 10/12. The series resulting from $\kappa = 1/3$ gave the most consistent a values. However, because of the price freeze in 1972 and 1973 these two values of a were discounted. The remaining four values of a, where $\kappa = 1/3$, were averaged to arrive at .83, the value of a to be used in the equation to determine probable authorized general rate increases given price and wage increases.

Limitations and future research needs.—The procedure followed for converting constant dollar to inflated dollar freight revenue does not recognize

(a) regional differences in general rate increases, nor

(b) selective or nonuniform application of general rate increases, altering the relationship between rate levels for different commodity groups.

In future refinements of procedures attempts should be made to take these factors into account, at least to the extent of following fairly clear-cut historical patterns.

As mentioned earlier, changes in the proportion of multiple-car shipments are a significant factor influencing the trend of constant dollar revenue per ton-mile. Since the revenue projections do not reflect this factor, they are—other things being equal—biased upwards. (Other excluded factors, not believed to be so significant, may have an offsetting influence.) At the least, taking this factor into account will involve special computer analysis of the waybill samples for 1966-75 on an aggregate industry level for each of the commodity groups in the study. But this is unlikely to suffice, since the multiple-car trend (including unit trains) affects some regions more than others. So long as the procedure followed does not differentiate between regions with respect to the underlying factors determining constant dollar revenue per ton-mile trends (particularly commodity mix), an adjustment for proportion of multiple-car shipments would not necessarily improve the accuracy of any given region's revenue projection. Future refinement should thus be directed at reflecting this factor and concomitantly at applying as many of the underlying factors as practicable on a regional basis.

TABLE NO. 2-1

Elasticity Factors Which Relate to Revenue

STCC	Tonnage	Mileage
01	-.356	-.295
10	-.523	-.330
11	-.336	-.417
14	-.451	-.376
20	-.344	-.224
24	-.689	-.188
26	-.382	-.337
28	-.470	-.306
32	-.599	-.303
33	-.410	-.379
37	-.449	-.253

Source: RMC Research Corporation, *The Structure of Railroad Freight Rates*, Contract 72-4 with Interstate Commerce Commission, August 1973.

TABLE NO. 2-2

Revenue per ton-mile index after applying tonnage elasticity factor

STCC	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
01	1.00	0.9886	0.9773	0.9659	0.9546	0.9432	0.9319	0.9205	0.9092	0.8978	0.8865
10	1.00	.9947	.9894	.9841	.9789	.9736	.9683	.9630	.9577	.9524	.9471
11	1.00	.9929	.9858	.9787	.9716	.9645	.9574	.9503	.9432	.9362	.9291
14	1.00	.9945	.9890	.9835	.9781	.9726	.9671	.9616	.9561	.9506	.9452
20	1.00	.9914	.9827	.9741	.9654	.9568	.9481	.9395	.9309	.9222	.9136
24	1.00	.9856	.9712	.9569	.9425	.9281	.9137	.8994	.8850	.8706	.8562
26	1.00	.9926	.9851	.9777	.9702	.9628	.9553	.9479	.9404	.9330	.9255
28	1.00	.9852	.9703	.9555	.9406	.9258	.9109	.8961	.8812	.8664	.8516
32	1.00	.9905	.9815	.9723	.9631	.9538	.9446	.9354	.9261	.9169	.9076
33	1.00	.9905	.9810	.9715	.9621	.9526	.9431	.9336	.9241	.9146	.9052
37	1.00	.9936	.9872	.9808	.9743	.9679	.9615	.9551	.9487	.9423	.9359

TABLE NO. 2-3

Revenue per ton-mile index after applying mileage elasticity factor

STCC	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
01	1.00	0.9944	0.9888	0.9832	0.9776	0.9720	0.9664	0.9608	0.9552	0.9496	0.9440
10	1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
11	1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
14	1.00	.9951	.9901	.9852	.9802	.9753	.9704	.9654	.9605	.9555	.9506
20	1.00	.9991	.9982	.9974	.9965	.9956	.9947	.9939	.9930	.9921	.9912
24	1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
26	1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
28	1.00	.9979	.9959	.9938	.9917	.9896	.9876	.9855	.9834	.9813	.9793
32	1.00	.9963	.9927	.9890	.9854	.9817	.9781	.9744	.9707	.9671	.9634
33	1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
37	1.00	.9982	.9964	.9946	.9928	.9910	.9891	.9873	.9855	.9837	.9819

TABLE NO. 2-4

Final index

1975	1.000000
1976	.991891
1977	.983724
1978	.972687
1979	.962497
1980	.954574
1981	.943863
1982	.931998
1983	.919617
1984	.905384
1985	.895414

TABLE NO. 2-5

Constant (1975) dollar—Freight revenue per ton-mile (cents)

	East less bankrupt	South	West less R.I.
1975[1]	2.260	1.879	1.938
1976	2.241	1.864	1.922
1977	2.223	1.848	1.907
1978	2.198	1.828	1.885
1979	2.175	1.809	1.865
1980	2.157	1.794	1.850
1981	2.133	1.774	1.829
1982	2.106	1.751	1.806
1983	2.078	1.728	1.782
1984	2.046	1.701	1.755
1985	2.024	1.683	1.735

[1] Actual historical levels for 1975, projected for 1976-85.

TABLE NO. 2-6

Projected freight revenue inflator

	AAR wage index (1)	AAR materials less fuel index (2)	Fuel index (3)	Combined wages and materials prices index (4)	Percent change (5)	Freight revenue inflator index (6)	Percent change (7)
1975	1.100	1.193	1.183	1.120	12.0	1.000	----------
1976	1.223	1.287	1.385	1.243	11.0	1.097	9.7
1977	1.313	1.370	1.551	1.337	7.5	1.186	8.2
1978	1.519	1.434	1.673	1.515	13.3	1.280	7.9
1979	1.607	1.496	1.764	1.599	5.5	1.394	8.9
1980	1.704	1.557	1.854	1.690	5.7	1.458	4.6
1981	1.807	1.626	1.947	1.787	5.7	1.528	4.7
1982	1.919	1.711	2.052	1.894	6.0	1.601	4.8
1983	2.054	1.791	2.149	2.018	6.5	1.684	5.1
1984	2.177	1.879	2.276	2.136	5.8	1.772	5.2
1985	2.317	1.987	2.396	2.270	6.3	1.860	5.0

Notes

(1) Used in funds flow model as inflator of labor compensatiop and related expenses, see Forecast Methodology No. 3 for prjection basis. 1974 = 1.00.

(2) Used in funds flow model as inflator for track materials expense projections and other materials and supplies expenses. See Forecast Methodology No. 3 for projection basis. 1974 = 1.00.

(3) Used to inflate fuel expenses in funds flow model. See Forecast Methodology No. 3. 1974 = 1.00.

(4) Combined by using weights of .7795 for (1), .1583 for (2), and .0622 for (3). Weights were obtained by solving algebraically for the implicit weights underlying the actual 1973 and 1974 combined indices for wages and materials prices.

(6) 1975 = 1.00.

Forecast Methodology No. 3

OPERATING EXPENSE PROJECTIONS

The general procedure followed in projecting total operating expense was to project components of operating expenses chargeable to freight service, then to adjust the sum to total operating expense by applying a constant ratio of total to freight expense. The ratios used for the groups presented here are:

East less bankrupts & ConRail	1.081 (1971-74 average)
South	1.024 (1972-74 average)
West less R.I	1.011 (1974 figure)

The separate components projected were:

(a) Labor compensation excluding track laying and surfacing
(b) Pensions; health and welfare benefits
(c) Materials and supplies excluding track
(d) Loss and damage to property
(e) Loss and damage to persons
(f) Locomotive fuel
(g) Track expenses

The discussion below explains the projection bases for these items in the order listed. The procedures for projecting depreciation charges are explained in Forecast Methodology No. 8. Retirement expense, found generally to be erratic and trendless, was held at a constant 1962-74 average level for the projected period. See table 3-11 for the projected components of operating expenses in constant 1975 and inflated dollars for each of the three railroad groups. Save for loss and damage expenses and fuel, regression analyses were conducted on historical data converted to 1974 constant dollars. The regression equation thus generate projections on a 1974 constant dollar basis. The price indices shown in table 2-6 are used to convert those projections to constant 1975 dollars or to inflated dollars.

Table 3-1 contains forecasts for certain price indices which form the basis of projected inflation rates for operating expense components. The consumer price index (CPI), the wholesale price index (WPI), the wholesale price index for industrial commodities (WPI_{IC}) and the wholesale price index for middle distillate fuel (WPIMDF) are included.

TABLE 3-1

Projected price indices, 1975-85

Year	CPI	CH	WPI	CH	WPI_{IC}	CH	WPIMDF	CH
		Percent		*Percent*		*Percent*		*Percent*
1975	1.612	9.1	1.749	9.3	1.715	11.5	3.09	13.7
1976	1.743	8.1	1.918	9.7	1.866	8.8	3.84	24.3
1977	1.876	7.6	2.060	7.4	2.000	7.2	4.30	11.8
1978	1.978	5.4	2.158	4.8	2.103	5.15	4.64	8.0
1979	2.068	4.5	2.264	4.9	2.205	4.85	4.89	5.4
1980	2.167	4.7	2.368	4.6	2.305	4.5	5.14	5.2
1981	2.273	4.8	2.484	4.9	2.418	4.9	5.40	5.1
1982	2.389	5.1	2.626	5.7	2.559	5.8	5.69	5.2
1983	2.529	5.8	2.760	5.1	2.693	5.2	6.03	6.0
1984	2.660	5.1	2.909	5.4	2.840	5.4	6.31	4.8
1985	2.813	5.7	3.086	6.1	3.021	6.3	6.65	5.3

NOTE: For all indices 1967 = 1.00. Indices and percentage changes are actual, historical for 1975 and projected for 1976-85.

See text for explanation of abbreviations.

The percentage changes listed above are from the year before and are rounded so that an error will occur if they are applied to the exact numbers of the indices.

Using the short-term Data Resources, Inc. (DRI), model as of October 1975, as a guideline, the indices for 1976 and 1977 were derived. The long-term DRI model, "Cycle Long 10/75," provided the annual percentage changes for 1978 through 1985, as well as further guidelines for the 1976-1977 period. The WPIMDF is a subcomponent of WPI05 (a price index for fuels and related products and power). Therefore, the forecast for WPIMDF was calculated based on DRI's projections of WPI05, taking into account the historical relationship between the two indices. The index used to inflate fuel expenses and to construct the revenue inflator is shown in table 2-6. This index was derived by applying successive percentage changes in the projected WPIMDF to the 1975 AAR index for fuel. WPIMDF was not used directly because it diverged significantly from the AAR index in 1975. It was, however, at the same level as the AAR index in 1974 and should, in the long run, set the pattern for changes in railroad fuel costs.

(a) *Labor compensation excluding track laying and surfacing.*—For purposes of projecting labor compensation, excluding track laying and surfacing, a historical series was constructed of constant dollar compensation chargeable to freight operating expense. Dollar amounts for total compensation (from ICC Annual Wage Statistics) chargeable to operating expenses are reported in ICC *Transport Statistics in the United States*. Wages chargeable to freight service are not reported but were estimated by applying historical ratios of operating expenses chargeable to freight service to total operating expenses. From these series, amounts chargeable to freight service in account No. 220, track laying and surfacing, were deducted. The resulting series were deflated by the AAR wage index to obtain constant dollar compensation, a series that is approximately equivalent in trend to one of service hours paid for.

One striking characteristic that shows up in analyzing historical series of labor compensation is the stability of ratios of compensation to revenues. For example, for the West less Rock Island group, from 1962 to 1974 the range of the ratio of compensation excluding track to freight revenue was .3756-.4370. In 10 of the 13 years the ratio was within the narrow range of .3912-.4171. This pattern is typical of all the groups. Clearly, any projection of compensation diverging significantly from the trend in freight revenue over a period of time would raise questions. Such a divergence could be due to biases either in the freight revenue or compensation projections. In any event, while the statistical techniques applied to compensation expenses projected these expenses independently of freight revenues, one of the criteria for selecting projection bases was the degree of stability in ratios of projected compensation to projected freight revenues (at about the historical levels).

A gradual decline in the compensation-to-revenue ratio could be accepted as reasonable where the projected figures are in constant dollars. The reason for this decline is labor productivity; both constant dollar freight revenue and compensation can decline over a period of time commensurately as a result of changes in the product mix, but compensation should decline somewhat more if there is real productivity increase. In inflated dollar terms, however, the wage rate can increase at a rate higher than the cost of living and absorb such productivity gains, leaving the ratio relatively stable.

Another possible explanation for the stability in historical compensation/revenue ratios is that railroad management is motivated by short-term liquidity conditions in controlling employment levels. In any year that freight revenues generate less cash than normal, employment may be cut back to maintain a minimum net cash flow for coverage of fixed charges—possibly resulting in deferred track maintenance or in cutbacks in train service, i.e., at the expense of deterioration in plant condition or service quality. To the extent that compensation levels have historically been affected in this manner, any statistical relationships that assume that labor expenses are systematically generated by work or service units like revenue ton-miles, gross ton-miles, train miles, et cetera, are subject to question.

Labor compensation less track is by far the most important component of operating expenses projected; it accounts for about 40 percent of total operating expenses for the three railroad groups. Certainly a great deal of care is called for in projecting this component. Yet the mechanism by which these expenses vary from year to year is far more complicated than time and resources have permitted to be determined accurately for the funds flow model thus far. Among the factors apt to be affecting compensation levels are (a) deferring or making up of work activity not directly associated with the level of traffic carried in any given year (primarily maintenance of way and equipment), (b) increase in real productivity—increases in traffic per labor input not explained by changes in commodity mix or service quality reduction but by, say, more automation of train operations or of car supply control, and (c) direct requirements for movement of trains and handling of cars (keeping service quality constant).

The projected funds flow model is directed essentially at identifying the revenue needs for meeting capital requirements of the industry, maintaining its financial health and capacity for rendering adequate service. It would consequently be desirable to segregate these factors affecting the level of compensation—to determine, for example, the operating expense savings from plant renovation as well as the limits on reductions of labor expenses relative to traffic if quality of service and plant condition are maintained. Future research should concentrate on this. The procedures followed here did not permit such a segregation but attempted to capture historical trends in the relationship of compensation to work or service units. The underlying assumption was that the prime influences measured were those of direct traffic level requirements and real productivity gains. The implementation of a cost accounting system, as required by section 307 of the 4R Act will permit finer segregation of labor expenses.

Preferably, the labor expenses should be broken down by the common groupings of maintenance of way, maintenance of equipment, rail-line transportation, et cetera. Then work or service units could be chosen that are causally and statistically better related to each group than the aggregate of such expenses is to any single work or service unit. Moreover, total operating expense projections could then be broken down by these common expense groupings. Such a breakdown should still be an objective of future research. For the present effort many difficulties were encountered in attempting to reconstruct historical series of the freight service, operating expense portion of each such group of labor expenses and to associate the Wage Statistics groups with the Uniform System of Accounts groups of operating expenses.

The choices in applying regression analysis to historical compensation data for projection purposes were:

(a) Use of revenue ton-miles, gross ton-miles in freight service, or freight train-miles as the basic explanatory traffic variable.

(b) Logarithmic or nonlogarithmic formulations.

(c) Use of compensation or of compensation per work or service unit (*e.g.*, gross ton-miles) as the dependent variable.

(d) Straight-line or curvilinear relationship for the time trend element.

The time trend element is assumed to represent productivity gains, and the mathematical form postulated incorporates an assumption as to whether productivity gains are constant or diminish over a period of time.

Preference was given *a priori* to gross ton-miles or train-miles as more causally related in terms of direct traffic requirements than revenue ton-miles. Revenue ton-miles is statistically as significant, but most likely because of the indirect influence of cash generated by revenues as discussed above. Choices of mathematical formulation for the regression equation and the time trend element were based not only on the usual measures of reliability (R^2, t - values of coefficients) but also on whether the projected compensation levels remained within realistic bounds as a ratio to projected freight revenues. For none of the selections did either standard have to be compromised.

The regression results did support hypotheses that productivity gains are dwindling over a period of time. This hypothesis was represented by use of the logarithm of the time trend element as an explanatory variable.

As explained in Forecast Methodology No. 1, revenue ton-miles were chosen as the basic traffic units to relate to the general economy (as measured by constant dollar GNP) in order to obtain overall traffic level projections for the funds flow model. Gross ton-miles and train-miles were projected by relating them to revenue ton-miles by regression analysis and applying the revenue ton-mile projections.

The regression equations selected for projecting compensation less track are shown in table 3-2. In general, the study showed that, lacking a more accurate and detailed understanding of the manner in which compensation is affected by liquidity constraints, service quality changes, real productivity change, and direct traffic requirements, one obtains projections that are very sensitive to the mathematical formulation postulated. Using historical ranges in ratios of compensation to freight revenue as benchmarks gives one more confidence in the projection selected.

TABLE 3-2

Regression equations used to project compensation excluding track laying and surfacing

East less bankrupts and ConRail

$$\frac{C}{GTM} = 5525.5 - 659.7\ (\ln t)$$

$$R^2 = .963$$

$$GTM = 51.7994 + 1.8007\ RTM$$

$$R^2 = .983$$

South

$$\operatorname{Ln} C = 11.1995 + \underset{(2.75)}{.48165}\ (\ln GTM) - \underset{(3.12)}{.10448}\ (\ln t)$$

$$R^2 = .540$$

$$GTM = 12.07914 + 2.2121\ RTM$$

$$R^2 = .981$$

West less R.I.

$$\frac{C}{Tr\text{-}mi} = 16.24915 - 1.62404\ (\ln t)$$

$$R^2 = .920$$

$$\operatorname{Ln} \frac{Tr\text{-}mi}{RTM} = 6.5741 - .01831\ t$$

$$R^2 = .958$$

Key to variables:

RTM - Revenue ton miles.

GTM - Gross ton miles in freight service.

Tr-mi - Freight train miles.

C - Compensation less track laying and surfacing, 1974 dollars.

t = 1, 1962.

Except for South, observation years were 1962-74; for South because of an apparent error in data bank entry for gross ton miles in 1974 that year was excluded as an observation.

T - values of regression coefficients are shown in parentheses.

As noted before, actual compensation data were deflated by the AAR wage index for application of regression analysis to develop the relationship to traffic for projection purposes. The constant dollar projections were inflated by projecting the AAR index. The projection is shown in Forecast Methodology No. 2.

The following equation was used to forecast the AAR wage index for the period 1978-1985:

$$\text{AAR wage index} = -0.43487 + 1.37936 \left[\text{CPI}_{(74\ =\ 100)}\right]$$

$$(t = 8.67161)$$

$$+0.09756\ \text{Ip}$$

$$t = 0.57376$$

CPI = Consumer price index, BLS

Ip = 3-year moving average of an index (1974 = 1) of the ratio of revenue ton-miles to constant dollar total compensation projected for all class I roads.

Inflation factors for the years 1976-1977 were calculated on the basis of standard terms of the current labor contracts, using the projected consumer price index for those years to estimate the effect of the cost of living clauses.[13]

(b) *Pensions and health-welfare benefits.*—Pensions and health-welfare benefits are a condition of employment, but, because of the characteristics of railroad labor conditions and the industry during the 1962-1974 period, there were no good correlations between pensions and health-welfare benefits and the number of employees. However, pensions and health-welfare benefits are closely correlated with compensation and these correlations were used for the projections.

Area	a	b	R^2	T values
Pensions				
East less bankrupts and ConRail	-27,563	.04817	.87181	8.64942
South	-2,864	.01759	.94764	14.10942
West less R.I.	-1,914	.01496	.92205	11.40657
Health-welfare benefits				
East less bankrupts and ConRail	-43,115	.09351	.96473	17.34577
South	16,583	.07048	.98076	23.68189
West less R.I.	56,635	.07290	.97954	22.94988

(c) *Materials and supplies (less track).*—The Uniform System of Accounts for railroads does not provide for a segregation of expenses for materials and supplies (less track). A historical series for each region was estimated by deducting, from freight operating expense, the other operating expense series being projected, viz. labor compensation, health and welfare benefits, pensions, loss and damage, fuel, depreciation, and track materials accounts (the amounts chargeable to freight expense). The resulting series represents a variety of items, *e.g.*, utitilies, contract work, equipment repair parts, and some fuel (not used for locomotives). A bias in the computation would result from whatever errors may have been made in estimating labor compensation chargeable to freight operating expense.

Another source of bias could be the price index selected to be applied to the series for projection purposes. The relationship between materials and supplies, expenses and traffic cannot be reliably estimated without adjusting for inflation in the historical expense data. Rather than attempting to select *a priori* the best price index to apply (which would presumably be the AAR price index for materials and supplies excluding fuel), the initial approach was to relate (by regression analysis) the actual historical data (inflated dollars) to revenue ton-miles and the BLS WPI_{IC}. The reasonableness of this procedure was tested by examining the implicit deflators obtained from the projections for each region. The implicit deflators could be derived by dividing the projected inflated materials and supplies expenses by the projected constant dollar expenses (the latter obtained by treating the WPI variable in the regression equation as being constant at the 1975 level). The implicit deflators showed significant variations between regions, indicating some bias in the regression estimates. Moreover, for the East less the bankrupts and ConRail and the West less the Rock Island, the expenses projected in this fashion appeared significantly high relative to historical levels and projected revenues.

---

[13] Increases in 1976: 3 percent on April 1, cost of living adjustments (at 1 cent per .4 increase in CPI (1967 = 100)) January 1 and July 1. Increases in 1977: 4 percent on July 1; cost of living adjustments (at 1 cent per .3 increase in CPI (1967 = 100)) on January 1 and July 1.

Consequently, for all groups presented, regression equations were estimated using the materials and supplies series deflated by the AAR materials and supplies index.

The following are the regression equations finally adopted for projections:

East less bankrupts and ConRail

$$\text{Ln M\&S} = 9.61283 + .67780 \ln \text{TM}$$

$$R^2 = .479 \quad \text{T value } 3.18$$

South

$$\text{Ln M\&S} = 9.32483 + \underset{(1.19)}{.66826} \ln \text{TM} + \underset{(.70)}{.0831} \ln t$$

$$R^2 = .886$$

West less R.I.

$$\text{M\&S} = -254136 + \underset{(10.66)}{3501.05}\ \text{TM}$$

$$R^2 = .904$$

Explanatory notes

M&S--materials and supplies less track; constant dollars (using, as deflator, the AAR index for materials and supplies exluding fuel).

TM--revenue ton-miles.

t--time, 1962 = 1.

Figures in parentheses under coefficients are T--values of respective coefficients.

See the section on track expense projections below for the basis of projecting the AAR price index for materials and supplies excluding fuel.

(d) *Losses and damages to property.*—Losses and damages to property are related to the volume of traffic, the value of the property lost or damaged, and perhaps to such things as the condition of the tracks and equipment. The condition of tracks and equipment is not amenable to regression analysis so loss and damage regressions were computed using revenue ton-miles, representing volume of traffic, and the WPI_{IC} representing value of commodities, individually and combined. While the regressions including both variables were considerably better than those including only one, these regressions did not represent a suitable fit (except for the East less bankrupts and ConRail regression, as discussed below). The major problem seemed to be in the value of the commodities lost or damaged. Apparently, the WPI_{IC} did not represent the same commodity-value mix that the losses did. In the absence of any other suitable index, the CPI was added. This apparently compensated for much of the deficiency in using only the WPI_{IC} which represented a better fit and made for more reasonable projections. These regressions and diagnostic statistics are shown in table 3-3. In the case of the East less bankrupts and ConRail group, inclusion of the CPI leads to a negative and seemingly insignificant coefficient for revenue ton-miles and to implausible projections. For this reason, the regression equation excluding CPI, as shown in table 3-3, was found preferable and was adopted.

TABLE 3-3

	R^2	a	Ton-miles		WPI_{IC}		CPI	
			Coef	T value	Coef	T value	Coef	T value
South	.90659	-22,987	279.5	2.23863	281.9	1.33747	-144.3	-0.50813
West less R.I.	.85923	-89,743	257.8	0.99669	659.5	0.52978	209.7	0.23257
East less bankrupts and ConRail	.81346	-24,682	111.4	1.16375	326.4	6.17390	------------	------------

(e) *Losses and damages to persons.*—Losses and damages to persons are due to injuries and fatalities caused by railroads, but the dollar amounts depend upon the settlements of claims submitted by injured parties. These claims represent efforts by the injured parties to convert their injuries and losses into monetary terms. One's view of monetary value is generally the present value which incorporates all past inflation and deflation. As a result, regressions were computed for losses and damages to persons using, as explanatory variables, revenue ton-miles, representing traffic volume, and the CPI, representing changes in monetary value. The regressions including both variables were selected as being the most significant and representing the best fit. The regressions used are shown in table 3-4.

TABLE NO. 3-4

Area	R^2	a	Ton-miles		CPI	
			Coef	T value	Coef	T value
South	.97608	-28,696	19.8	0.41307	381.6	7.09823
West less R.I.	.98126	-79,533	69.0	1.27482	874.5	5.73860
East less bankrupts and ConRail	.95062	-16,705	-12.0	-0.29933	281.8	13.63678

(f) *Locomotive fuel.—A priori*, it would appear that there should be a close relationship between the amount of fuel used and the number of locomotive miles and tons traveled. Consequently, regressions were computed using gallons of fuel with locomotive miles, tons, and revenue ton-miles individually. Rergressions of gallons of fuel and tons were unreliable because there were no distances associated with tons. Regressions using locomotive miles were better but still unsatisfactory, probably because switching is calculated by hours and then converted to miles. The miles-per-hour conversion factor may be inaccurate enough to cause the poor fit.

Revenue ton-miles, a combination of tons hauled and miles traveled, showed high and significant correlations with gallons of fuel consumed. Table 3-5 shows the regression results.

TABLE 3-5

Area	a	b	R^2	T value
South	-21,939	4,561.3	.95139	14.67337
West less R.I.	296,440	4,261.7	.97331	20.02953
East less bankrupts and ConRail	350,342	1,509.3	.13865	1.33065

These regressions, except for the East less bankrupts and ConRail, represented good fits and were used for the projections. Since revenue ton-miles had been forecasted for the period, projections of gallons of fuel were readily obtained. Instead of the regression equations shown in table 3-5 for the East less bankrupts and ConRail, the basis of that group's projection was a series of regression equations for this group and the U.S. total; projections from equations for the South, West less R.I., and R.I. were deducted from the projection from a U.S. total regression. This difference was prorated to the East less bankrupts and ConRail based on the ratio of estimates from that group's regression equations to the combined total of those estimates and estimates from a bankrupt East and ConRail group regression equation. This procedure yielded projections more reasonably related to changes in traffic level. Regression equations used for this computation, in addition to those used in table 3-5, were:

U.S.	$183501 + 4557.2$ RTM $R^2 = .943$
ConRail and bankrupt East	$353261 + 1865.9$ RTM $R^2 = .752$
R.I.	$25781 + 4169.5$ RTM $R^2 = .225$

Once the gallons-of-fuel projections were obtained, it was necessary to have fuel prices for the different areas. This necessitated the creation of price series for each area. ICC *Transport Statistics of the United States* for 1962 and 1963 carried detailed information on fuel inventories, purchases, and prices paid, but these tables were discontinued in 1964. Price series were obtained by extending the 1962 and 1963 prices by using the changes in the AAR spot fuel price indexes. These prices were then multiplied by the number of gallons to derive pure fuel accounts. Since the AAR spot prices are not necessarily the actual prices paid, these "pure fuel accounts" were compared with the ICC fuel accounts, which include labor and supplies associated with fuel. Information available to us indicated that the cost of fuel was approximately 95 to 96 percent of the ICC fuel accounts. Adjustments were made for those years which were obviously too high or too low. From these, we obtained the final price series.

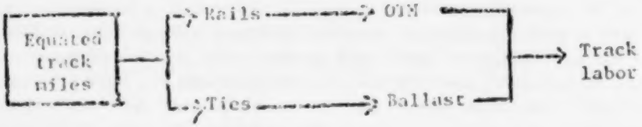
The 1975 constant dollar projections were derived by multiplying the projections of gallons of fuel times the 1975 prices. Current dollar amounts were derived by multiplying the gallons of fuel times the projected prices which were obtained by applying the changes in the forecasted fuel price index (see table 2-6).

(g) *Track expenditures.*—This section deals with the projected amounts allocated to freight service for the following operating expense accounts:

212—Ties
214—Rails
216—Other track material (OTM)
218—Ballast
220—Track laying and surfacing

Track laying and surfacing is essentially a labor expense item; the other accounts represent costs of materials. Separating track from other operating expenses for projection purposes was considered necessary for adequate recognition of true capital expenditure requirements of railroad operations, despite the classification of most of track expenditures as operating expenses under the betterment system of accounting for track.

The basic logic of the track expenditure projections is illustrated as follows:



Equated track miles were calculated for the year 1974 by adding 80 percent of branch line running miles and 50 percent of all switching, crossover, et cetera, track-miles to 100 percent of all main, running track-miles (see table 3-7). These formed the basis of the projection for rails, which utilized a gross ton life formula, and for ties, which is based on years of service life. The use of equated track-miles recognizes the reduced maintenance needs of branch switching and other lines.[14] OTM and ballast expense were related to rails expense and ties expense, respectively, on the grounds that systematic scheduling of track work would associate these track elements in that fashion. Regression analysis is used to measure the relationship; the results are shown in table 3-10. Similarly, a relationship was postulated between track labor and total track materials expense and estimated by regression analysis (see table 3-10).

The projected tie expenses were adjusted (prior to use for forecasting ballast expenses) to account for declining trackage over a period of time at the same average rate as the decline over the 1962-74 period for each railroad group. A similar adjustment was not made for rail expenses because the formula used to estimate those expenses would not be significantly affected; declines in track-miles are offset by concomitant increases in traffic density, on which the expenses are based.

The freight service portion of the projected expenses was derived by applying averages for recent years (varying according to railroad group, see table 3-10) of the ratios of freight expense to total expense (for track materials combined and for track labor).

The regression analyses relating OTM to rail expenses, ballast to tie expenses, and track labor to track material expenses were conducted using constant 1974 dollar values of all the series. The AAR price index for materials and supplies other than fuel served to deflate all the track material data and the AAR index for wages to deflate track labor expense. Use of a single index assumes that the percentage price changes for all of the different track materials are about the same over a period of years or at least not divergent enough to involve significant errors of measurement. An examination of the deflated data, however, left doubts about this assumption; some of the deflated series showed rising trends where there was little reason to expect any. Chase Econometrics, in a study for U.S.R.A.,[15] obtained a breakdown of the AAR price index for rails, ties, and OTM; their data confirms the inadequacy of the foregoing assumption. For greater reliability, hence, future projections should be made based on individual price indices applicable to each of the track materials. This will require soliciting the data, which is unpublished, from the AAR annually.

The results of applying the techniques described above to obtain track expense projections often failed to bear out the underlying assumption that the timing of replacements of individual track elements is systematically related to the timing of rail or tie replacements. While it may be effective as a maintenance policy for railroads in good financial and operating conditions, systematically replacing ballast when ties are replaced or other track material when rails are replaced may not be feasible for railroads plagued by continual cash shortages. For these railroads, the best *short*-term, cash-saving policy may be to make only spot replacements upon discovering track elements in unserviceable condition. Moreover, it should be kept in mind that all track elements are long-lived capital assets whose service lives can vary a good deal among individual items; in any given year, for example, relatively much greater or less OTM can fall due for replacement than rail.

---

[14] The equated track-miles measure used here differs from the conventional one (used, *e.g.*, in *Moody's Transportation Manual*) in that the conventional one does not differentiate between branch lines and main lines and assigns a weight of 80 to second or third, et cetera, running tracks.

[15] Chase Econometrics, Inc., *An Economic Model for the Railroad Industry*, No. PB-239020 (Washington, D.C.: National Technical Information Service, 1974).

In order to inflate materials expenses, a regression equation, shown in table 3-10, was used. An adjustment to the regression estimates was found necessary to reflect the actual 1975 price experience, which veered significantly from the long-term relationship to the WPI for industrial commodities. The AAR charge-out index for 1975 was not considered an appropriate basis for this adjustment because it constitutes an aberration. It is affected by a shortening in lag time between purchases and charges to expenses (recognized in a 1975 revision in construction of the index by AAR) which should not be carried into the long-term forecast. In essence it represents a delayed reflection of the dramatic increase in materials prices from 1973 due to oil and material shortages and general price instability experienced in 1974. The adjustment for actual 1975 price conditions was made by linking successive percentage changes in the price index derived directly from the regression equation to an estimated average 1975 spot price index.[16] It is anticipated that further updating of the funds flow model with time will obviate special adjustments of this type for 1975 or produce an improved approach to such an adjustment if found necessary.

A discussion of the special computations made for rails and ties follows. Finally, planned improvements in future research are recapitulated.

Rails.—Rail wears out with usage, and since gross tons is a commonly accepted measure of usage, rail replacement needs were computed on the basis of gross ton life. An AREA formula for gross ton life was adopted for this purpose, varying with weight of rail and annual traffic density.[17]

$$T - .545\ WD^{.565}$$

where T - gross ton life
W - weight of rail (in pounds per yard)
D - density, in millions of gross ton-miles per track mile

Both weight of rail and traffic density forecasts had to be developed for each railroad group. As an estimate of the weight of rail *being replaced* (as opposed to the weight of rail being laid in replacement—the difference being the betterment portion) the following computation provided an approximation:

---

[16] The index was constructed by dividing the average of April 1, July 1, and October 1, 1975, spot price indices reported by AAR for materials and supplies excluding fuel by a corresponding average of the indices for 1974. The result of the calculation is 1.193.

[17] TOPS On-line Services, Inc., "The Economic Analysis of Roadway: An Interim Report on Development of Methodologies and Procedures," prepared for Federal Railroad Administration, Contract DOT-FR-30028, San Francisco, CA, March 1974, p. V-11, quoting AREA (American Railroad Engineering Association) Bulletin 615, September/October 1968, pp. 75-94.

$$W = \left[2000 \times \begin{array}{l}\text{total tons}\\ \text{of rail re-}\\ \text{placed in}\\ \text{1974}\end{array}\right] \div \left[\begin{array}{l}\text{Total}\\ \text{rail}\\ \text{miles}\end{array} \times 1760\right]$$

$$\times \begin{array}{c}\text{adjustment fac-}\\ \text{tor for running}\\ \text{tracks[18]}\end{array} \times \left[\frac{\text{Amount chargeable to operat-ing expenses + salvage}}{\text{Total amount including betterments}}\right]$$

The data for the computation derive from table 92 worksheets of ICC *Transport Statistics in the United States* and selected carriers' Form R-1, schedule 515.

Traffic density was projected as gross ton-miles divided by total track-miles operated, holding total track-miles operated constant over the forecast period and projecting gross ton-miles on the basis of regression analyses of gross ton-miles against revenue ton-miles (see table 3-10).

The gross ton life obtained by the above formula represents only one replacement cycle for a particular rail. Thus, it is essential to apply the appropriate salvage factor (reflecting relay value) to the estimates derived from the formula. Estimates of tons of rails replaced each year are obtained, using this gross ton life, by the following computations:

$$\frac{\text{(gross ton-miles/total track-miles operated)}}{\text{gross ton life}} \times \begin{array}{c}\text{equated}\\ \text{track-miles}\end{array} = \begin{array}{c}\text{equated track}\\ \text{miles replaced}\end{array}$$

$$\begin{array}{c}\text{Equated track-}\\ \text{miles}\\ \text{replaced}\end{array} \times 2 \times 1760 \times \left[\begin{array}{c}\text{av. lbs./yd.}\\ \text{of rail}\\ \text{laid in}\\ \text{replacement}\end{array}\right] \div 2000 = \begin{array}{l}\text{tons re-}\\ \text{placed}\end{array}$$

These tons replaced are priced using each group's 1974 cost per ton from the table 92 worksheets. The amount chargeable to operating expenses according to schedule 515 is obtained by applying the ratio of amount chargeable to operating expenses to total including betterments. But a further adjustment, and a rather substantial one at that, was found necessary because the figure thus far obtained does not account for the amount actually realized in the sale of scrap rail (beyond that allowed for in the books). This adjustment was based on the ratio of operating expense account 214 (rails), schedule 320, to the amount chargeable to operating expenses shown in schedule 515, for the year 1974. This procedure assumes that the relatively high ratio of scrap value to cost new in 1974 will be maintained in the future.

Table 3-8 shows some of the computations described above. The computation of gross ton life for each group in that table is based on actual reported 1974 gross-ton miles. The projected 1976-85 rail expense estimates are based on projected gross ton-miles and gross ton-densities, not on 1974 gross ton-miles and gross ton-densities, which are shown in the table for illustrative purposes only.

---

[18] Table 92 does not provide the data needed to limit the computation to running track rails, for which gross tons is the appropriate measure of usage (as opposed to switching tracks). Carriers selected to represent respective groups are C&O, SCL, UP, and ATSF. The adjustment factor consists of the ratio of computed average weight of running track rail to that of all rails.

Ties.—The railroads' ASTRO studies have used 35 years as an industry standard for cross tie service life. It is most probable that actual service life varies according to railroad group, considering differences in access to lumber supplies and in climate. An initial application of 40 years as a service life across the board, in fact, underestimated for the South and East less bankrupts and ConRail but seemed to fit well for the West. Further confirmation of regional differences was sought in some Bureau of Valuation tie life studies, conducted in the 1940's, for individual roads located in the South and the East. The studies that were examined (for the Southern, New Haven, and Atlantic Coast Line—other reports not being readily available) showed service lives of 22 1/2 or 25 years for treated crossties. Judging from the probable increase in durability from improved treatment processes since the 1930's, a 30-year life was assumed for the South and the East.

The computations for tie operating expenses in 1974 dollars are summed up as follows:

$$\frac{\text{Equated track-miles}}{\text{Service life}} \times \left[\begin{array}{c}\text{2600 (cross ties}\\ \text{per track-}\\ \text{mile)}\end{array}\right] \times \begin{array}{c}\text{cost}\\ \text{per tie}\\ \text{1974}\\ \text{dollars}\end{array} = \begin{array}{c}\text{cross tie}\\ \text{costs}\end{array}$$

$$\text{Cross tie costs} \times \left[\frac{\text{total costs, including switch and bridge ties}}{\text{cross tie costs}}\right]_{\text{year 1974}} = \begin{array}{l}\text{total}\\ \text{tie costs}\end{array}$$

$$\text{total tie costs} \times \left[\frac{\text{amount chargeable to operating expenses}}{\text{total charges}}\right]_{\text{year 1974}} = \begin{array}{l}\text{tie}\\ \text{operating}\\ \text{expenses}\end{array}$$

These computations, based on data from table 93 worksheets of ICC *Transport Statistics in the United States* are shown in table 3-6.

Planned improvements.—Further research in developing track expenditure projections should take the following course:

(a) Trying alternative formulations of the equated track-mile concept.

(b) Applying separate price indices to different track elements to estimate relationships between OTM and rail, ballast and ties, track labor and materials, and to convert the projections to inflated dollars.

(c) Exploring engineering formulas as alternatives to the present procedures for OTM, ballast, track laying and surfacing.

(d) Exploring survival curve or other engineering analyses of retirements as bases for predicting track replacements.

TABLE 3-6

Projections of rails, ties, other track materials, and ballast—total operating expense (thousands 1975 dollars)

	East less bankrupts & ConRail	South	West less R.I.
		Rails	
1976	9,383	34,114	68,526
1977	9,611	34,939	70,406
1978	9,710	35,198	71,331
1979	9,814	35,541	72,185
1980	10,024	36,223	73,769
1981	10,188	36,790	75,054
1982	10,285	37,242	76,288
1983	10,365	37,632	77,566
1984	10,213	37,248	77,062
1985	10,274	37,735	78,281
		Other track materials	
1976	20,436	32,966	73,831
1977	20,656	33,547	75,049
1978	20,841	33,730	75,649
1979	21,017	33,969	76,203
1980	21,206	34,449	77,230
1981	21,377	34,848	78,062
1982	21,529	35,165	78,862
1983	21,672	35,439	79,691
1984	21,765	35,168	79,364
1985	21,894	35,511	80,154
		Ties	
1976	34,159	47,512	91,998
1977	34,074	47,484	91,612
1978	33,990	47,454	91,226
1979	33,905	47,424	90,842
1980	33,820	47,396	90,460
1981	33,737	47,366	90,080
1982	33,652	47,336	89,702
1983	33,569	47,307	89,325
1984	33,485	47,277	88,949
1985	33,402	47,249	88,575

Projections of rails, ties, other track materials, and ballast—total operating expense (thousands 1975 dollars)—Continued

	East less bankrupts & ConRail	South	West less R.I.
		Ballast	
1976	10,141	9,449	25,818
1977	10,124	9,445	25,726
1978	10,107	9,440	25,635
1979	10,090	9,437	25,543
1980	10,074	9,433	25,453
1981	10,057	9,429	25,363
1982	10,040	9,425	25,273
1983	10,024	9,421	25,183
1984	10,007	9,418	25,095
1985	9,990	9,414	25,005

TABLE NO. 3-7

Computation of equated track-miles

	Main, running (1)	Branch, running (2)	All crossover and switching (3)	Equated track-miles (4)
East less bankrupts and ConRail	24,582	6,965	18,250	39,279
South	30,256	9,323	19,338	47,383
West less Rock Island	66,973	52,573	47,484	132,773

Notes:

Columns 1-3, Source: Schedule 411, Annual Report Form R-1, 1974.
Column 1 - line 55, cols. d + e + f, of Schedule 411.
Column 2 - line 56, cols. d + e + f, of Schedule 411.
Column 3 - lines 55 + 56, cols. g + h + i, of Schedule 411.
Column 4 - Column 1 + .8 x column 2 + .5 x column 3.

TABLE NO. 3-8

Rail expense computations

	East less bankrupts and ConRail	South	West less R.I.
A. *Gross ton life*			
1. Total tons laid in replacement	222,101	326,112	783,567
2. Rail-miles replaced	2,134	2,700	7,559
3. Average pounds per yard, all rail [a]	118.2	137.2	117.8
4. Amount chargeable to salvage and operating expense + total charges	.9165	.8357	.8829
5. Estimated pounds per yard of rail being replaced (1.3 x 1.4)	108.4	114.7	104.0
6. Adjustment for running track (see text)	1.002	1.056	1.0085
7. Estimated average pounds per yard running track	108.6	121.1	104.9
8. Gross ton-miles——mill.	301,620	362.790	1,070,400
9. Track miles operated, running and passing	34,925	43,879	132,537
10. Density (GTM/track mile)	8.636	8.268	8.076
11. Gross ton life [b]	200.1	217.7	186.1
12. Life in years based on 1974 density	23.2	26.3	23.0
B. *Cost factors*			
13. Cost per ton——dollars	128.18	137.95	121.75
14. Proportion chargeable to operating expenses according to Schedule 515	.4636	.6150	.5398
15. Amount chargeable to operating expenses, Schedule 515——thousands dollars	13,198	27,699	51,515
16. Operating expense, account 214, Schedule 320——thousands dollars	5,048	21,722	38,089
17. Proportion actually charged to chargeable per Schedule 515	.3825	.7842	.7394

[a] (Tons x 2000) + (miles x 1760)

[b] See text for formula.

Source: 1974 Annual Report Forms R-1, primarily Schedule 515.

TABLE NO. 3-9

Tie expense computation

	East less bankrupts and ConRail	South	West less R.I.
1. Equated track-miles	39,279	47,383	132,773
2. Service life	30	30	40
3. Track-miles replaced [a]	1,309.3	1,579.4	3,319.3
4. Cross-ties replaced [b] --------thousands	3,404.2	4,106.4	8,630.2
5. Cost per cross-tie------------dollars	7.627	8.952	8.487
6. Total charges for cross-ties [c] ------thousand dollars	25,964	36,760	73,244
7. Ratio total charges to cross ties only [d]	1.1172	1.0954	1.0722
8. Total tie expenditures [e] --------thousand dollars	29,007	40,267	78,532
9. Proportion chargeable to operating expense [f]	.98960	.98963	.98609
10. Tie operating expenses [g] -----------thousand dollars	28,705	39,849	77,440
11. Adjustment factor for declining trackage [h]	.002488	.0006211	.004204

[a] Line 1 ÷ line 2

[b] Line 3 x 2600

[c] Line 4 x line 5

[d] Total charges including switch and bridge ties ÷ charges for cross-ties only.

[e] Line 6 x line 7

[f] Amount chargeable to operating expenses ÷ total charges.

[g] Line 8 x line 9

[h] Rate of decline of total track miles operated, computed as

$$\frac{(\text{1962 track miles} - \text{1974 track miles}) \div 12}{(\text{1962 track miles} + \text{1974 track miles}) \div 2}$$

TABLE NO. 3-10

Regression results and other projection bases

1. AAR PRICE INDEX FOR MATERIALS AND SUPPLIES OTHER THAN FUEL

$$\ln(AARI_{MS}) = -4.504 + .9002 \ln WPI_{IC}$$

$$R^2 = .984$$

$AARI_{MS}$ = AAR price index for materials and supplies excluding fuel (1974 = 100)

WPI_{IC} = B.L.S. wholesale price index for industrial commodities (1967 = 100)

The regression equation was not used directly to project $AARI_{MS}$. See text for explanation.

2. GROSS TON-MILES

East Less Bankrupts and ConRail

$$GTM = 81{,}849{,}668 + 1.652532\ RTM$$

$$R^2 = .957$$

South

$$GTM = 103{,}625{,}640 + 1.635245\ RTM$$

$$R^2 = .979$$

Observation for 1974 omitted (apparent error in data bank)

West Less R.I.

$$GTM = 303{,}854{,}180 + 1.781340\ RTM$$

$$R^2 = .967$$

t = time (= 1-1962)

GTM = gross ton-miles

RTM = revenue ton-miles

Regression results and other projection bases—Continued

3. OTHER TRACK MATERIAL

East Less Bankrupts and ConRail

$OTM = 942.35 + .18776\ R + 230.05\ \ln t$

$R^2 = .58$

South

$OTM = 754.18 + .70263\ R$

$R^2 = .835$

West Less Rock Island

$OTM = 2465.6 + .64817\ R$

$R^2 = .702$

OTM = Other track material operating expense deflated by $AARI_{MS}$ (tens of thousands dollars)

R = Rails operating expense deflated by $AARI_{MS}$ (tens of thousands dollars)

t = time (= 1-1962)

4. BALLAST

East Less Bankrupts and ConRail

$B = 283.270 + .19792\ T$

$R^2 = .807$

South

$B = 275.1 + .12978\ T$

$R^2 = .683$

West Less R.I.

$B = 334.178 + .2373\ T$

$R^2 = .711$

Regression results and other projection bases—Continued

B = Ballast operating expense, deflated by $AARI_{MS}$, tens of thousands of dollars.

T = Ties operating expense, deflated by $AARI_{MS}$, tens of thousands of dollars.

t = Time (= 1-1962)

5. TRACK LAYING AND SURFACING

East Less Bankrupts and ConRail

$\ln L = 6.42429 + .29248 \ln M$

$R^2 = .59$

Data entered as 3-year moving averages

South

$L = 5244.1 + .35932 M$

$R^2 = .8641$

West Less R.I.

$L = 14571.7 + .75066 M - 2231.1 \ln t$

$R^2 = .844$

Data entered as 3-year moving averages

t = 1-1963

L = Track laying and surfacing operating expense, deflated by AAR wage index, tens of thousands 1974 dollars.

M = total track materials (rails, ties, OTM, ballast) operating expense, deflated by $AARI_{MS}$, tens of thousands 1974 dollars

(Table No. 3-10)-Continued

6. RATIOS OF FREIGHT TO TOTAL EXPENSE

	Labor	Material
East Less Bankrupts -- *and ConRail*	.9401 (1965-74 av.)	.9805 (1973 value)
South-----------------	.9900 (1971-74 av.)	.9933 (1973-74 av.)
West Less R.I.--------	.9951 (1974 value)	.9952 (1974 value)

Data used in computations are historical series from Schedule 320 of Annual Report Form R-1 for operating expenses and amounts allocated to freight service for accounts 212 through 218 (for a total of materials) and account 220 (for labor).

TABLE NO. 3-11

BREAKDOWN OF OPERATING EXPENSE PROJECTIONS

A. Eastern district excluding bankrupt lines (inflated dollars, thousands)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Railway operating expenses:										
Labor compensation (less track)	$1,266,143	$1,430,361	$1,680,875	$1,809,135	$2,004,968	$2,196,164	$2,367,037	$2,561,740	$2,593,379	$2,779,227
Track labor compensation	91,220	98,067	113,534	120,196	127,598	135,436	143,912	154,110	163,238	173,796
Health welfare benefits	74,197	86,313	102,303	111,126	125,948	140,119	152,061	165,400	163,910	176,239
Pension benefits	31,674	37,434	44,568	48,642	55,758	62,506	68,059	74,208	72,781	78,383
Fuel	192,661	232,711	257,084	280,533	314,575	348,201	378,237	406,686	410,043	442,440
Loss & damage to persons	30,912	34,541	37,363	39,843	42,517	45,411	48,625	52,523	56,302	60,579
Loss & damage to property	50,149	55,625	59,477	63,330	67,664	72,221	77,336	82,144	86,129	92,360
Materials & supplies (exc. track)	507,765	569,169	608,861	649,633	706,355	762,845	818,160	870,000	885,978	948,196
Track materials	78,399	83,845	87,977	92.001	96,130	100,707	106,178	111,324	116,550	123,394
Retirements	432	432	432	432	432	432	432	432	432	432
Subtotal	2,323,552	2,628,498	2,992,474	3,214,871	3,541,945	3,864,042	4,160,037	4,478,567	4,548,742	4,875,046
Adjustment factor[1]	1.081	1.081	1.081	1.081	1.081	1.081	1.081	1.081	1.081	1.081
Depreciation	185,501	197,605	204,848	216,416	235,976	254,574	269,796	282,591	288,577	302,873
Operating expenses (adjusted)	2,697,260	3,039,011	3,439,712	3,691,691	4,064,818	4,431,603	4,766,796	5,123,921	5,205,767	5,572,797

B. Southern district inflated dollar, thousands

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Railway operating expenses:										
Labor compensation (less track)	1,130,238	1,249,284	1,451,941	1,548,738	1,678,837	1,810,788	1,946,792	2,104,433	2,188,148	2,361,460
Track labor compensation	108,728	117,267	135,850	143,983	153,248	163,013	173,538	186,133	196,833	210,042
Health welfare benefits	67,041	74,541	86,717	92,654	100,868	109,148	117,618	127,377	131,992	142,816
Pension benefits	18,290	20,277	23,578	25,172	27,346	29,543	31,800	34,408	35,716	38,596
Fuel	246,542	298,929	330,317	359,355	401,408	442,693	484,646	524,155	537,825	589,316
Loss & damage to persons	40,832	46,149	50,118	53,656	57,643	61,867	66,438	71,907	76,781	82,778

See footnote at end of table.

BREAKDOWN OF OPERATING EXPENSE PROJECTIONS—Continued

B. Southern district (inflated dollars, thousands)—Continued

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Railway operating expenses:—Con.										
Loss & damage to property	$47,031	$52,300	$54,821	$57,851	$62,205	$66,376	$70,717	$74,263	$74,756	$79,887
Materials & supplies (exc. track)	519,571	585,437	625,600	669,219	727,910	788,143	853,610	916,016	944,853	1,029,249
Track materials	132,917	143,057	150,226	157,403	165,287	173,874	184,011	193,557	201,991	214,919
Retirements	1,555	1,555	1,555	1,555	1,555	1,555	1,555	1,555	1,555	1,555
Subtotal	2,312,745	2,588,796	2,910,723	3,109,586	3,376,307	3,647,000	3,930,725	4,233,804	4,390,450	4,750,618
Adjustment factor[1]	1.024	1.024	1.024	1.024	1.024	1.024	1.024	1.024	1.024	1.024
Depreciation	195,077	219,653	236,558	262,119	301,673	341,311	377,730	411,984	434,289	477,670
Operating expenses (adjusted)	2,563,327	2,870,580	3,217,138	3,446,335	3,759,011	4,075,839	4,402,792	4,747,399	4,930,109	5,342,302

C. Western district excluding Rock Island inflated dollars, thousands

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Railway operating expenses:										
Labor compensation (less track)	3,276,166	3,732,799	4,380,945	4,684,671	5,174,336	5,635,501	6,127,287	6,718,778	6,814,514	7,411,445
Track labor compensation	304,913	327,494	377,696	398,350	422,515	447,749	475,198	508,513	534,948	569,309
Health welfare benefits	191,796	221,633	260,876	279,539	311,504	341,129	372,638	410,541	412,481	450,573
Pension benefits	51,232	58,228	68,281	72,966	80,467	87,546	95,100	104,188	105,781	114,957
Fuel	696,290	840,212	939,261	1,022,908	1,140,073	1,253,989	1,380,339	1,510,653	1,572,554	1,725,523
Loss & damage to persons	101,548	115,773	126,004	135,102	146,092	157,301	169,349	183,607	194,263	209,588
Loss & damage to property	176,934	198,254	212,084	225,287	242,672	259,591	278,438	297,739	307,190	329,605
Materials & supplies (exc. track)	1,544,207	1,824,140	2,004,745	2,184,650	2,457,979	2,726,872	3,034,753	3,359,741	3,448,511	3,842,898
Track materials	279,326	300,334	315,618	330,425	346,678	364,274	385,553	406,032	423,949	450,882
Retirements	9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572
Subtotal	6,631,984	7,628,439	8,695,082	9,343,470	10,331,888	11,283,524	12,328,227	13,509,364	13,823,763	15,114,352
Adjustment factor[1]	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011
Depreciation	428,645	473,307	499,713	538,552	600,178	662,974	722,223	781,846	818,408	891,180
Operating expenses (adjusted)	7,133,580	8,185,658	9,290,440	9,984,800	11,045,716	12,070,616	13,186,060	14,439,813	14,794,232	16,171,789

See footnote at end of table.

BREAKDOWN OF OPERATING EXPENSE PROJECTIONS—Continued

D. Eastern district excluding bankrupt lines (1975 constant dollars, thousands)

	Projected income statement									
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Railway operating expenses:										
Labor compensation (less track)	$1,138,804	$1,198,322	$1,217,223	$1,238,362	$1,294,287	$1,336,901	$1,356,822	$1,371,915	$1,310,389	$1,319,443
Track labor compensation	82,046	82,158	82,217	82,275	82,369	82,445	82,492	82,532	82,481	82,510
Health welfare benefits	66,735	72,311	74,084	76,066	81,304	85,296	87,163	88,578	82,820	83,670
Pension benefits	29,943	29,812	29,754	29,692	29,565	29,462	29,402	29,350	29,446	29,408
Fuel	164,562	177,496	181,787	188,135	200,724	211,567	218,057	223,876	213,128	218,450
Loss & damage to persons	27,221	27,102	27,049	26,993	26,877	26,784	26,729	26,682	26,769	26,735
Loss & damage to property	45,220	46,323	46,813	47,337	148,406	49,275	49,788	50,222	49,409	49,732
Materials & supplies (exc. track)	470,679	495,634	506,535	518,057	541,222	559,701	570,464	579,514	562,518	569,299
Track materials	72,672	73,012	73,191	73,367	73,656	73,889	74,033	74,154	73,999	74,086
Retirements	432	432	432	432	432	432	432	432	432	432
Subtotal	2,098,314	2,202,602	2,239,085	2,280,716	2,378,842	2,455,752	2,495,382	2,527,255	2,431,391	2,453,765
Admustment factor[1]	1.081	1.081	1.081	1.081	1.081	1.081	1.081	1.081	1.081	1.081
Depreciation	183,811	192,953	197,370	204,557	216,911	227,660	235,201	240,507	241,181	245,917
Operating expenses (adjusted)	2,452,088	2,573,965	2,617,820	2,670,010	2,788,439	2,882,327	2,932,708	2,972,469	2,869,514	2,898,436

E. Southern district (1975 constant dollars, thousands)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Railway operating expenses:										
Labor compensation (less track)	1,016,567	1,046,620	1,051,438	1,060,119	1,083,756	1,102,306	1,115,931	1,127,008	1,105,632	1,121,107
Track labor compensation	97,793	98,244	98,377	98,557	98,927	99,233	99,474	99,682	99,456	99,717
Health welfare benefits	60,298	62,448	62,797	63,422	65,114	66,443	67,420	68,215	66,693	67,802
Pension benefits	39,416	39,682	39,767	39,880	40,111	40,307	40,466	40,605	40,468	40,643
Fuel	210,584	228,003	233,571	240,996	256,130	268,980	279,403	288,541	279,546	290,968
Loss & damage to persons	35,833	36,075	36,152	36,255	36,465	36,643	36,787	36,914	36,789	36,948

See footnote at end of table.

BREAKDOWN OF OPERATING EXPENSE PROJECTIONS—Continued

E. Southern district (1975 constant dollars, thousands)—Continued

	Projected income statement									
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Railway operating expenses:—Con.										
Loss & damage to property	44,665	48,075	49,165	50,618	53,581	56,097	58,137	59,926	58,165	60,401
Materials & supplies (exc. track)	481,622	509,800	520,461	533,675	557,737	578,262	595,182	610,166	599,898	617,964
Track materials	123,209	124,575	124,979	125,523	126,646	127,571	128,302	128,930	128,247	129,038
Retirements	1,555	1,555	1,555	1,555	1,555	1,555	1,555	1,555	1,555	1,555
Subtotal	2,111,542	2,195,077	2,218,262	2,250,600	2,320,022	2,377,397	2,422,657	2,461,542	2,416,449	2,466,143
Adjustment factor[1]	1.024	1.024	1.024	1.024	1.024	1.024	1.024	1.024	1.024	1.024
Depreciation	192,722	212,972	225,520	244,065	271,682	297,714	319,816	339,106	350,035	371,384
Operating expenses (adjusted)	2,354,941	2,460,730	2,497,020	2,548,679	2,647,384	2,732,168	2,800,616	2,859,725	2,824,478	2,896,714

F. Western district excluding Rock Island (1975 constant dollars, thousands)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Railway operating expenses:										
Labor compensation (less track)	2,946,674	3,127,249	3,172,508	3,206,682	3,340,240	3,430,576	3,512,254	3,598,177	3,443,254	3,518,597
Track labor compensation	274,247	274,366	273,512	272,673	272,750	272,564	272,390	272,329	270,300	270,280
Health welfare benefits	172,506	185,679	188,916	191,346	201,088	207,660	213,602	219,861	208,419	213,910
Pension benefits	99,101	101,955	103,397	104,748	107,313	109,446	111,541	113,757	112,877	115,017
Fuel	594,737	640,858	664,164	685,997	727,457	761,925	795,780	831,597	817,368	851,959
Loss & damage to persons	90,092	92,686	93,997	95,225	97,557	99,496	101,401	103,416	102,615	104,561
Loss & damage to property	164,229	173,922	178,820	183,409	192,123	199,367	206,482	214,010	211,019	218,289
Materials & supplies (exc. track)	1,431,421	1,588,467	1,667,825	1,742,171	1,883,345	2,000,712	2,115,990	2,237,952	2,189,501	2,307,286
Track materials	258,924	261,531	262,575	263,501	265,630	267,269	268,828	270,461	269,170	270,711
Retirements	9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572
Subtotal	6,041,503	6,456,285	6,615,286	6,755,324	7,097,075	7,358,587	7,607,840	7,871,132	7,634,095	7,880,182
Adjustment factor[1]	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011	1.011
Depreciation	423,825	459,777	478,597	505,393	546,977	586,737	621,225	653,541	670,029	704,506
Operating expenses (adjusted)	6,531,784	6,987,081	7,166,651	7,335,025	7,722,119	8,026,268	8,312,751	8,611,255	8,388,099	8,671,370

---

[1] Ratio of total to freight operating expenses.

Forecast Methodology No. 4A

EQUIPMENT EXPENDITURE PROJECTION

1. *General review*

Projected equipment expenditures are shown in table No. 4A-1 broken down by major equipment category, by railroad group, and in 1975 constant as well as inflated dollars. Except for highway and miscellaneous equipment and for work equipment, the figures include leased equipment not written into the carriers' property accounts.[19]

The projections are close to those submitted by the railroads in Ex Parte No. 271 in reply to the Special Projects Counsel Opening Statement (see witness Martin's verified statement). The total cumulative 1976-85 projection is 27.754 in millions of 1975 constant dollars, as compared with $22,430 million for the railroads' 1974-83 estimates, in terms of 1974 dollars. By comparison with the railroads' projected 622,900 cars installed in their forecast period at a cost of $14,950 million 1974 dollars, the results obtained here are 737,100 cars at a cost of 19,080 million 1975 dollars. But in contrast to the 20,500 locomotives installed projected by the railroads at a cost of $6,230 million 1974 dollars over the 1974-83 period, this study projects a total of 15,082 locomotives at a total cost of 6,425 million constant 1975 dollars.

These forecasts can also be compared with those underlying the U.S.R.A.'s Final System Plan. Strong, Wishart & Associates, Inc., reported to U.S.R.A., in June 1975, that with utilization improvements as set forth in their reports, a unified ConRail need only acquire 24,483 cars in the 1976-85 period, but 54,158 cars without such improvements. The estimate obtained here for the same period is 51,016 cars, relatively close to the Strong, Wishart projection without utilization improvement. The time pattern of acquisitions is somewhat different, U.S.R.A.'s showing a distinctly lower rate of acquisitions in the first 5 years.

Much more effort was concentrated on the freight car projection than on the other equipment categories, considering the importance of freight car expenditures relative to other equipment expenditures. Of total equipment expenditures for additions and betterments for all districts in 1974, freight car expenditures comprised 63.7 percent.

Of the freight cars installed, fully 38.3 percent are projected to be open hopper cars over the forecast period, reflecting the expected growth of coal traffic. The establishment of Railbox[20] will have a significant impact on the level of equipment expenditures, since Railbox cars are technically classified as private cars. This impact is accounted for in the projections.[21] Also considerable efforts were directed at making reliable allocations of the total industry expenditure projections for freight cars to the study railroad groups. These allocations served also as bases for the car hire projections.

---

[19] For the freight cars and locomotive projections, data in terms of physical units (*e.g.*, carloads by car type, units installed) were readily available; projected units installed are priced out, and for purposes of estimating debt and (for freight cars) lease payments assumptions are made respecting the proportion leased, not written into the property accounts. Such was not the case for the other equipment categories. For those, the portion purchased (financed by equipment obligations) and the rent payments are projected independently. Amounts expended for additions and betterments and written into the property accounts (i.e., purchased), are obtained from schedule 211 of the Railroad Annual Report Form R-1. Rents payable and receivable are obtained from schedule 376. Physical unit data are not available for highway revenue and miscellaneous equipment, and while such data are available for work equipment, the multiplicity of types makes the use of such data impracticable given the relative insignificance of the dollar amounts involved.

[20] Railbox is a Trailer-Train subsidiary set up to develop a boxcar pool for the railroads.

[21] Accordingly the rent projections (discussed in another section) include estimated rental payments for the Railbox cars.

The BLS wholesale price index for railroad equipment was found historically to track quite well with the pattern of the ICC construction cost index for freight cars, discontinued since 1967.[22] This index, as constructed, includes locomotive prices. It is applied here to all equipment categories (both for obtaining initial constant 1975 dollar projections and for converting these projections into constant 1975 and inflated dollars), except for highway and miscellaneous equipment, to which the BLS wholesale price index for motor vehicles and equipment was applied. Projections for these indices were obtained by relating them, by regression analysis, to the wholesale price index for industrial commodities, for which long-term projections were available from Data Resources, Inc. Percent changes from year to year in the regression estimates were applied successively to the 1975 actual values of these two indices to obtain the final projections. The regression equations were not used directly because of the significant divergencies of the regression estimates for 1975 from the actual values. The regression results are detailed in table 4A-4, and the price indices (historical and projected series) are shown in table 4A-2.

Although U.S.R.A. made projections for freight car expenditures applicable to the eastern bankrupt carriers and ConRail (sometimes alluded to in the tables as "Bankrupt East"), it was found necessary to make independent projections for that group. The reason for this is that, unlike the U.S.R.A. freight car projections, those developed here are on an industrywide basis and maintain a very direct interrelationship between the different railroad groups with respect to cars owned and on the lines of each group. A lesser share of total installations for one group implies a greater share for others and a concomitant change in the balance of rents payable and receivable as between groups.

Below, projections for each category of equipment are discussed in turn, with particular attention centered on the freight car projections. Table 4A-4 contains most of the regression results and other bases used to project the various series. All tables have been placed at the end of this forecast methodology.

Generally, while it would be difficult and was not attempted here, it would ultimately be desirable for equipment requirements to be forecasted applicable to varying levels of service quality as well as the savings in equipment expenditures that would result from increased expenditures for roadway rehabilitation and modernization. Much may be learned from the impressive research work sponsored by the U.S.R.A. in these areas. But any further research into these areas is strongly encouraged.

II. *Freight cars*

A. Overview of procedures.—The freight car expenditure projections are built up by car type, following AAR groupings. It was found necessary to use the car type classifications used by the AAR for reporting purposes because AAR statistics are the only available source of annual carloadings by car type, which form the basis of the projections of fleet requirements for each car type. There are some important differences between these classifications and those used in ICC, *Transport Statistics in the United States;* the differences in definition of boxcars are particularly significant, the ICC category including many cars as boxcars which AAR classifies as refrigerator cars.

---

[22] One advantage of the ICC index was that it related specifically to freight cars. Should a breakdown between freight cars and locomotives remain unobtainable for the BLS index, there would be distinct advantages to resumption of the ICC index.

No installations were assumed for tank cars, stock cars, and "other" cars (a residual category into which highly specialized types fall), since investment activity was expected to be either nil or negligible. Nonetheless, fleet requirements were developed for tank cars and "other" cars.[23]

Table 4A-3 shows the detail underlying the year by year computation of cars installed, by type, at the U.S. total level. The computation for any given year is as follows:

$$\text{Cars installed} = \text{Total fleet required} \times \text{Proportion owned by class I railroads} - \text{Ownership previous year} + \text{Cars retired}$$

$$\text{Where total fleet requirement} = \left(\frac{\text{Carloads}}{\text{Trips per year}}\right) \times \left(\frac{1}{1\text{—bad order rate}}\right)$$

Where the initial results of the computations are negative installations for some years, the installation projections are averaged out with contiguous years having positive levels of installations to derive a positive series; this procedure recognizes that even during traffic slumps car production continues, albeit at depressed levels, as a result of either prior commitments, or expectations of traffic growth which extend beyond the immediate cyclical downturn. In making the computations it became clear from the inordinately low levels of fleet requirements resulting that it was inappropriate to use the reported yearend levels of the freight car fleet, since (for one thing) the trips per year figures were constructed by the AAR by using during-the-year levels for both carloads and size of the car fleet. In order to approximate most closely the levels to which the trips per year figures pertain, the starting points for the computation of installations (i.e., the 1975 requirement levels) were obtained by working back from the actual carloading level, trips per year, and average bad order rate for 1975 for each car type.

Trends in deflated car prices by rebuilt and new installations were analyzed to price out the installations by car type. The dollar values of installations for all car types summed together were allocated to the five railroad groups by synthesizing two approaches described in more detail below; one considers 1964-74 trends in shares of total U.S. installations and the other is based on ton-miles per car on line, cars on line to ownership ratios, and retirement levels for each group.

B. Total fleet requirements.—A critical factor, to which much of the study effort was devoted, is trips per year. Subsumed in this factor are the trends in utilization improvements, shifts in traffic handled between car types over a period of time, affecting the length of haul and thus, the turnaround time for each car type. An extensive analysis was conducted of these substitution trends.

The trend in trips per year for the fleet as a whole (all car types combined) is basically flat, oscillating around a level of 20. Many factors could account for this pattern, but one explanation has much grounding in the facts. Length of haul for the industry has increased steadily over the study period (1958-73), largely because of continual losses to motor carriers in short-haul markets. The impact of this has apparently been enough to offset the positive effects of improved utilization through unit trains, computerized exchange of car location information, mergers, et cetera. Undoubtedly, the rapidly deteriorating state of the Northeast rail plant had a depressing effect on car utilization in that cars were tied up for longer times in transit.

---

[23] These tank car and "other" car projections helped in making sounder estimates of total carloadings and fleet requirements, which are used to make mutually consistent projections for locomotives, shares of total car ownership, and car hire payments.

The Federal Railroad Administration predicted a 10-percent increase in car utilization as a result of improved car information systems (like TRAIN II).[24] A greater increase was expected from improved train scheduling and operating practices. But these expectations do not add up to a definite sharp departure from past trends toward more trips per year, and the working assumption underlying most of the projections is that doubts are resolved in favor of modestly optimistic extension of past trends.

The most dominant trend in car type substitution was found to affect plain boxcars. While the shift to equipped boxcars and TOFC flatcars was leveling off by 1969, the shift of plain boxcar traffic to covered hopper cars was accelerating in 1969. About half of the traffic that shifted away from plain boxcars shifted to covered hopper cars (of the 31.6 percent of 1969 carloads by plain boxcars shifting to other car types, 16.6 percent was shifting to covered hopper cars). But 35 percent of the plain boxcar traffic was found to represent commodities in which boxcars remained relatively stable and dominant.

There has been a rapid shift away from refrigerator cars, with much of the traffic characteristically carried by refrigerator cars now moving in refrigerated trailers on flatcars.[25] Traffic by nonmeat, nonmechanical refrigerator cars has practically evaporated, the greater part of it taken up by plain boxcars. Meat, nonmechanical refrigerator traffic, has largely shifted to TOFC flatcars.

Car types characterized by traffic in which they have maintained a dominant share are general service open hopper, stock, special service flat, general service gondola, tank, nonmechanical refrigerator, and since (1966) autorack.

Alternative curve fits were made to historical series of trips per year, by regression analysis and otherwise, and plotted; selection among these alternatives was based on judgments considering the foregoing car type substitution patterns as well as on the closeness of fit to historical data. The estimating equations used for projection purposes are shown in table 4A-4.

Carloadings by car type were projected by relating them, in most cases, to tonnage originated of selected commodities of significance to the car type in question[26] by regression analysis using annual U.S. total series. Exceptions to this are plain and equipped boxcars, based on quarterly data (since data were not reported by that breakdown until 1969) and refrigerator cars, related directly to commodity production. The projections of tonnage originated, on which the carloading figures are based, are explained in Forecast Methodology No. 1.

---

[24] National Commission on Productivity, *Improving Railroad Productivity* (1973), p. 298. On page 291 of this report a chart is reproduced from D. P. Ainsworth, *et al.*, *Toward an Effective Demurrage System* (Greenwich, Conn.: Reebie Associates, 1972), p. 41, which shows that 52 percent of the time freight cars are empty and under railroad control. It would appear from this that there is substantial potential for utilization improvement from better empty car distribution.

[25] As an example of the dramatic shift in some important commodities, 68.3 percent of the carloads of fresh fruits in 1964 went by non-meat, non-mechanical refrigerator cars; by 1969, 65.1 percent went by TOFC flat cars. Similarly, 73.5 percent of the carloads of fresh vegetables in 1964 went by non-meat, non-mechanical refrigerator cars; by 1969, 60.2 percent went by TOFC flat cars.

[26] Initial selection of commodities was based on the same analysis of the 1964, 1966, and 1969 waybill sample that was conducted to analyze car type substitution patterns. Final selection depended on results of regression analyses as explained below. The 1-percent carload waybill sample is the only readily available source for distribution of traffic by both commodity group and type of car.

Table 4A-4 shows the commodity groups selected for each car type projection. It was found that the regression results and projections obtained from them tend to be sensitive to the particular commodities selected for inclusion. For this reason, conclusions from the analysis of historical trends in car type substitution were relied upon as criteria for final selection of key commodities and regression formulations. Regression equations yielding projections in line with the car type substitution analysis were selected over those that were not. The impact of growing tonnage per car on car requirements is taken into account largely in the regression analysis relating carloads for each car type to tonnage originated for respective key commodity groups.

The bad order rates (unserviceable cars as a proportion of cars on-line) were derived as the average of 1971-74 midyear and yearend figures for the bad order rate by car type.

C. **Installations.**—The proportion of cars owned by class I railroads, by car type, was projected as a year-by-year, straight-line extrapolation from the actual 1975 proportion based on the average annual change from the 1966-68 average to the 1972-74 average for the proportion of the total fleet owned. Exceptions were made for plain boxcars, flatcars, and refrigerator cars. In the case of plain boxcars, Railbox will figure prominently as a new factor radically divergent from past trends.[27] From the projection of the plain boxcar requirements, the anticipated Railbox fleet was deducted to arrive at the proportion owned directly by class I railroads. In the case of flat and refrigerator cars, the private portion has been quite unstable from year to year as cars have been shifted from short-term to long-term lease status. Graphic analysis appeared to support a level of about .7 percent for the proportion owned of flat cars for the future and an eventual transfer of all refrigerator cars to direct railroad owned status.

Retirements of freight cars derive from application of a computerized survival curve analysis to each car type for all roads but those covered by the USRA Final System Plan. The 1972 age distribution of the fleet was assumed to hold in 1974, and the 1975 level of cars in service was assumed to hold through the forecast period. Retirement figures for the Bankrupt East excluding the Erie Lackawanna were obtained from a study done for the USRA Final System Plan.[28]

D. **Pricing of cars installed.**—Table 4A-5 consolidates all assumptions used in the projections for proportion of cars rebuilt and average cost per car in 1974 dollars for each car type. The data source used to develop these figures was table 37 of ICC, *Transport Statistics in the United States*, Part I (for 1962-74). The attempt initially was to find an appropriate price deflator for freight cars and to estimate by regression analysis time trends in deflated car prices (for new and rebuilt units separately) and proportion of units rebuilt, for each car type. The Bureau of Labor Statistics wholesale price index for railroad eqiupment (which covers freight cars and locomotives) corrects for change in product mix and quality. Projected trends in constant dollar prices were thus expected to reflect whatever trends might exist in size and quality of new freight cars. Most regression results, however, were poor, reflecting little or no definite long-term trend for most car types. Instead, for most series, a period of years was selected by analysis of graphs of each series for construction of averages which represented our best judgment of the levels most likely to hold for the future; this permitted elimination of extreme values, in some cases appearing to be reporting errors or highly unusual, probably unrecurring circumstances. In some cases regression time trends were found acceptable. In the case of covered hopper cars a declining trend in new prices was found, indicating perhaps that production cost savings have been realized as greater numbers of these cars have been ordered annually. For most car types, the fact that deflated prices do not show an increasing trend suggests that trends in increasing sizes of new cars may have stabilized.

---

[27] Curtis D. Buford, in a verified statement (April 22, 1974) submitted in F.D. No. 27589 and No. 27590, *American Rail Box Car Co.—Pooling*, 347 I.C.C. 862, testified as to rail box plans to install 10,000 cars in service at the start, 26,000 cars in 5 years, and 67,000 cars in 10 years. These numbers are used in our projections.

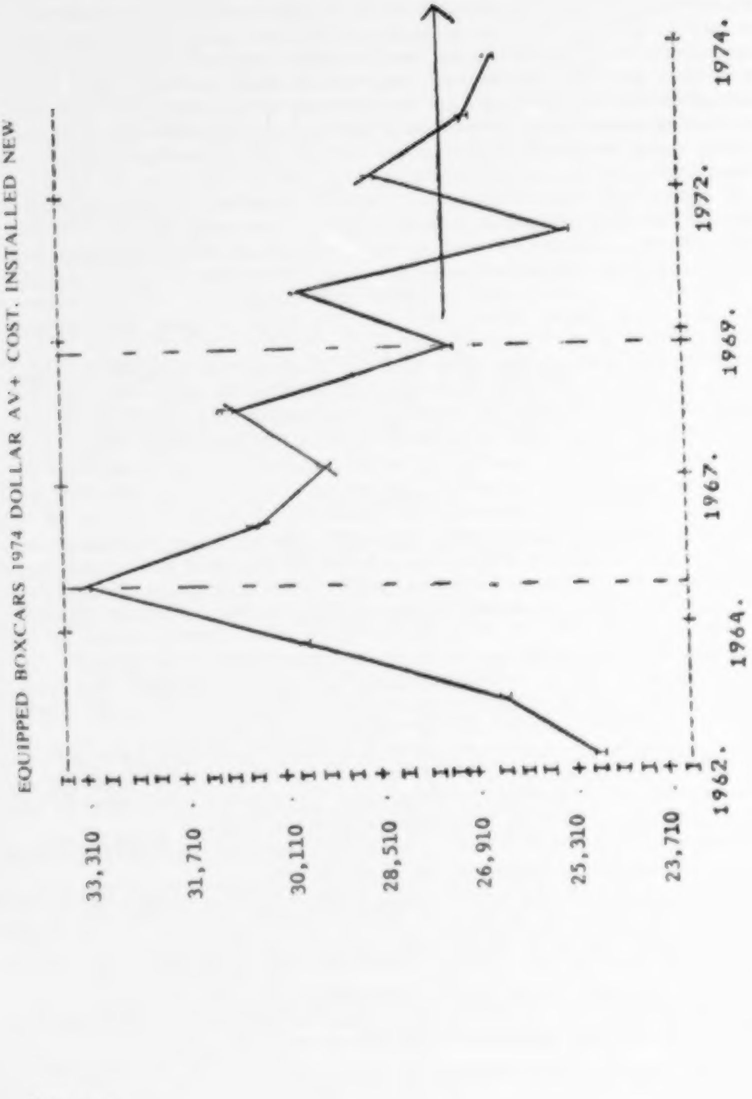
[28] Strong, Wishart & Associates, Inc. "Assumptions and Data Sources for Freight Car Equipment Forecasts, Final System Plan," San Francisco, May 1975. See Forecast Methodology No. 8 for further explanation of the retirement forecasts for regions other than the Bankrupt East.

The following example illustrates the process, not only for estimates of car prices but wherever we indicate use of graphic analysis to select an appropriate time period for constructing an average in lieu of regression estimates found unsatisfactory.

As shown in table 4A-5, we estimated the cost of new equipped boxcars installed at $27,300, the average for 1969-74. A straight-line regression of price against time using observations for 1962 to 1974 yielded an R^2 of only .038. A quadratic formula with time for the same observation period improves the R^2 notably—.547—but the projected trend based on this equation drops implausibly a good deal below the historical observation range to about $21,500, by 1984. Shortening the period of observations to 1965-74 yields a much higher R^2—.884—for the quadratic formulation, but also leads to a similarly implausible projected trend, an upturn to $30,460 by 1984. As evidenced by the unstable regression results, the price trend was shifting over the 1962-74 period. The following graph shows how. Among the possible explanations for these shifts are (a) the fact that the mix of mechanical designations within the equipped boxcar category may be changing significantly, or (b) errors of measurement in applying an aggregate price index for railroad equipment (encompassing freight cars and locomotives) to a particular car type category. For whatever reason, it is clear that the movement of the series breaks down into three periods of distinctly different trends:

1962-65 (rising)
1965-69 (dropping)
1969-74 (stagnant)

We have no reason to expect either an upturn or a downturn from the 1969-74 level for the next few years and thus adopt the average 1969-74 level as our 1976-85 forecast estimate.


EQUIPPED BOXCARS 1974 DOLLAR AV+ COST. INSTALLED NEW

E. Allocation to the railroad groups.—The freight car projections were made on a national basis in recognition of the fact that, despite some constraints in the form of car service rules, freight cars regardless of ownership flow through the nationwide rail network much as a single, integrated fleet. Nonetheless, it is necessary to obtain an equipment expenditure forecast for each of the railroad groups, and much care had to be taken in allocating the projected number of cars installed in a fashion that would approximate what reasonably could be expected for each of the groups given its traditional share of cars installed and relative traffic demands. Freight car expenditures by net originating roads have been proportionately greater than for net terminating roads because it is the net originating roads that have, under the past system of coordinative arrangements, provided the greater portion of freight car requirements for interline movements.

In order to minimize the chance for error in estimating projected shares, we followed two different approaches and synthesized the results of each. The first approach was to estimate time trends, by regression analysis, in the proportional share of cars installed by each railroad group (using data from schedule 417 of the railroads' Annual Report Form R-1 to the Commission, shown in section A-1 of ICC *Transport Statistics in the United States*, years 1962-74). Projected shares were adjusted proportionately to sum to one for each year.

The second approach was much more elaborate and was designed to utilize information developed on projected ton-miles and cars retired for each railroad group. Time trends were estimated by regression analysis for ton-miles per average cars on line (the cars on line as reported in AAR Car Service Division form CS-8A); for the East less bankrupts and ConRail, no trend was found, and for ConRail and the eastern bankrupt carriers, an upward trend starting in 1969 was detected which was extended to 1984 (not by regression—see table 4A-4). The ratio of cars on line to ownership[29] was similarly projected by time trend, regression analysis, the projected figures adjusted proportionately to result in a weighted average of one for each year. Dividing ton-miles per car on line into ton-miles yields cars on line, and dividing cars on line by cars on line to ownership ratios yields ownership; this was the sequence followed to obtain a first-cut ownership by railroad group. These ownership figures were adjusted proportionately to add to the total ownership level consistent with the levels obtained by car type for the projection of total U.S. cars installed. Then, given the retirements for each railroad group, we estimated the number of cars that would have to be installed to maintain the foregoing ownership levels.

These installation estimates were found to be quite erratic, and 3-year moving averages (2-year averages for 1976 and 1985) were taken of each before converting them to shares of cars installed by railroad group. Tables 4A-6 to 4A-10 show all the figures projected and used in the computations just described.

After examining graphs of results for the two approaches we concluded that these could be synthesized as follows for the various groups:

For the East less bankrupts and ConRail, South, and West less Rock Island, an average of the two results for shares of cars installed was adopted. This results in increased shares relative to the historical trend for the East less bankrupts and ConRail and West less Rock Island, probably reflecting the increased coal traffic underlying the ton-mile projections for those groups.

For the bankrupt East and ConRail, the two approaches roughly coincided, and the traffic/retirement-based approach was adopted.

---

[29] Also from AAR Car Service Division reporting form CS-8A.

For the Rock Island, the historical trend is higher than the traffic/retirement-based projection. The latter was chosen because of the greater degree of error likely in projecting for an individual railroad (particularly one of only moderate size like the Rock Island) on the basis of a share of U.S. total figures.

The results of the two approaches (for 1975, 1979, and 1984) and their synthesis are shown in table 4A-11.

Besides lowering chances for error or biases the synthesis of the two approaches combines the advantages of each. The historic trends reflect whatever consistency there is in investment behavior which is unlikely to alter very drastically. The traffic/retirement-based projections reflect relative traffic demands projected for each group and each group's particular replacement needs. Results of the impact of this procedure on the overall funds flow projections will be carefully examined and comparisons against actual levels of cars installed will be made. The traffic/retirement-based projections may, for example, prove reliable enough to stand by themselves for every group.

III. CABOOSES

The U.S. total number of cabooses to be installed annually were estimated at the 1971-74 average level (from ICC *Transport Statistics in the United States*, table 22). Deflated price trends and proportion rebuilt were obtained as for freight cars, discussed above; results are detailed in table 4A-5. The dollar value of expenditures was allocated to the various groups according to the projected shares of locomotive installations.

IV. LOCOMOTIVES

As shown in table 4A-12, the total required fleet of freight switching units is expected to decline from 4,631 for 1976 to 4006 for 1985, while the required number of freight road units is estimated to grow from 22,870 in 1976 to 24,580 in 1985. The projection was made independently, on the basis of certain utilization trends:

(a) Car-miles per road locomotive mile are assumed to remain at 23, the level around which this ratio has been fluctuating since 1965. A car-mile projection was derived from the carload projections done for the car expenditure projections.[80] This step yields a road locomotive mile projection.

(b) Road locomotive miles per road locomotive in service are expected to bottom out and begin rising (a curve was fitted by regression analysis—see table 4A-4 for details). This step yields the road locomotive units projection.

(c) Locomotive switching miles were related to carloads by regression analysis (table 4A-4) and thereby projected to 1985.

(d) A constant upward trend in switching miles per switching locomotive in service was extrapolated in 1985. The steady increase might be due to release of units from inefficient yard classification work, which is continually being automated through modern technology for service to shippers and receivers surrounding terminal areas.

---

[80] The carloads projected for each type of car (except stock cars) were added together and the total adjusted by applying the ratio of 1973 carloadings for these car types (source: AAR) to total carloadings for 1973 from ICC *Transport Statistics in the United States*.

Locomotive retirements were derived by the same procedure as for freight cars—a computerized survival curve analysis assuming the same age distribution of the fleet in 1975 as in 1972. See Forecast Methodology No. 8.

Table 4A-12 shows the computation of annual U.S. total locomotives installed, 1976-85 according to the steps described above and similar, in the application of retirement data, to the computations for freight cars.

Trends in deflated prices and proportion rebuilt were obtained as described above for freight cars. See table 4A-5.

Locomotive expenditures were allocated to the various railroad groups according to time trend, regression analysis of historical shares of total locomotives installed, as described above for freight cars and using the same data source. See table 4A-4 for details. Projected shares were adjusted to add to one by keeping the share for West less Rock Island and for Rock Island constant and adjusting projected shares for East less bankrupts and ConRail and South and eastern bankrupts less ConRail to add to the balance. This pattern was judged most appropriate after analyzing graphs of the series projected. The foregoing procedure is not as well grounded when applied to locomotives as it is when applied to freight cars. Individual railroad locomotive fleets are more closely related to traffic requirements on their respective lines than are their freight car fleets, which relate in part to meeting requirements of interline movements. Hence, by way of improvement of the funds flow model in the future, separate projections will be made for each region on the basis of respective utilization trends traffic and retirement levels. It is likely, for example, that the present forecast allocates too large a share of the locomotive expenditures to the South relative to the traffic forecasted for the South. As a result largely of expected growth in coal traffic, shifts are expected in relative traffic growth trends between the South, on the one hand, and the East less bankrupts and ConRail and the West less Rock Island, on the other.

Another practicable improvement would be obtaining separate projections for road and switching units.

V. WORK EQUIPMENT

Expenditures for work equipment were analyzed as part of the analysis of roadway structure investment (described in another section), which examined carefully deflated, long historical series of expenditures for additions and betterments in the light of trends in technological substitution of types of road property. The projections for East less bankrupts and ConRail, South, and West less Rock Island are derived from that analysis. For the bankrupt East and ConRail and the Rock Island, expenditures for additions and betterments (from schedule 211 of the railroads' Form R-1) were averaged for 1973-74 and 1971-74, respectively, after deflation with the BLS wholesale price index for railroad equipment.

VI. MISCELLANEOUS AND HIGHWAY REVENUE EQUIPMENT

Additions and betterments for these two equipment property accounts were obtained from schedule 211 for each railroad group and deflated by the BLS wholesale price index for motor vehicles and equipment. The projections were derived as the average 1972-74 levels for these series (except for highway revenue equipment: East less bankrupts and ConRail—1972-73—and South—1972 and 1974 values). Though 1971-74 data were available in our computer data bank (not for earlier years), 1971 (and other years, in some instances) was not used because negative figures were reported for those years, evidently reflecting accounting adjustments more than investment expenditure levels.

VII. FREIGHT CAR AND LOCOMOTIVE BETTERMENTS

Schedule 211 of Annual Report Form R-1 shows expenditures for additions and betterments. Table 37 of ICC *Transport Statistics in the United States* shows number of units and cost per unit of cars and locomotives added to the railroads' property accounts. The latter thus provided an estimate of the expenditures for additions only, broken down by locomotives and freight cars. Deflating the difference between the schedule 211 additions and betterments and the table 37 additions and averaging over the 1971-74 period resulted in the annual betterment figure used for our projections: $35.0 million for locomotives and $82.2 million for freight cars, in 1974 dollars. These figures were separately allocated to the study railroad groups by applying the shares of locomotive installations and of freight car installations, respectively.

TABLE NO. 4A-1

EQUIPMENT EXPENDITURE PROJECTIONS

Freight cars, 1975 constant dollars (thousands)

Year	East less bank.	South	West less R.I.	Bank. East	R.I.	U.S. total
1976	324,762	339,640	1,045,650	92,305	19,473	1,821,830
1977	332,862	359,533	1,050,117	102,998	21,800	1,867,309
1978	222,041	238,287	617,843	72,718	13,887	1,164,776
1979	298,209	366,949	830,231	77,092	16,440	1,588,921
1980	451,039	585,526	1,264,262	181,684	25,389	2,507,900
1981	420,043	584,564	1,266,803	195,586	27,143	2,494,138
1982	332,039	498,596	1,121,158	204,015	26,972	2,182,778
1983	276,410	454,261	1,092,593	120,068	24,373	1,967,704
1984	153,547	278,386	646,212	91,224	60,549	1,229,919
1985	264,138	511,130	1,157,880	166,650	154,534	2,254,331
			Inflated dollars			
1976	356,263	372,584	1,147,074	101,259	21,362	1,998,541
1977	393,550	425,084	1,241,577	121,777	25,775	2,207,763
1978	277,087	297,360	771,013	90,746	17,330	1,453,536
1979	391,507	481,753	1,089,977	101,211	21,584	2,086,032
1980	620,872	805,999	1,740,304	250,095	34,949	3,452,218
1981	608,430	846,736	1,834,955	283,304	39,316	3,612,741
1982	510,767	766,978	1,724,651	313,832	41,490	3,357,717
1983	448,779	737,539	1,773,939	194,943	39,572	3,194,771
1984	263,673	478,047	1,109,682	156,650	103,976	2,112,027
1985	484,022	936,627	2,121,774	305,380	283,178	4,130,981

EQUIPMENT EXPENDITURE PROJECTIONS—Continued

Year	East less bank.	South	West less R.I.	Bank. East	R.I.	U.S. total
Locomotives, 1975 constant dollars (thousands)						
1976	119,062	316,084	414,931	144,945	19,478	1,014,501
1977	98,344	272,735	351,063	119,723	16,480	858,344
1978	60,119	173,851	219,706	73,188	10,314	537,178
1979	71,735	215,943	268,237	87,329	12,592	655,836
1980	85,909	268,793	328,522	104,585	15,422	803,231
1981	69,783	226,607	272,769	84,953	12,805	666,917
1982	60,435	203,412	241,351	73,573	11,330	590,101
1983	48,672	169,590	198,502	59,253	9,318	485,336
1984	29,159	105,056	121,394	35,498	5,699	296,806
1985	49,801	185,324	211,547	60,627	9,931	517,229
Inflated dollars						
1976	130,611	346,743	455,178	159,004	21,368	1,112,904
1977	116,274	322,461	415,070	141,551	19,485	1,014,840
1978	75,023	216,951	274,173	91,332	12,871	670,350
1979	94,178	283,503	352,158	114,651	16,532	861,021
1980	118,257	370,004	452,222	143,966	21,229	1,105,678
1981	101,080	328,238	395,104	123,054	18,548	966,024
1982	92,965	312,904	371,265	113,175	17,429	907,738
1983	79,025	275,346	322,289	96,204	15,130	787,993
1984	50,073	180,403	208,458	60,958	9,786	509,678
1985	91,258	339,600	387,652	111,097	18,198	947,804
Cabooses, 1975 constant dollars (thousands)						
1976	1,633	4,335	5,691	1,988	267	13,915
1977	1,594	4,421	5,691	1,941	267	13,915
1978	1,557	4,503	5,691	1,896	267	13,915
1979	1,522	4,582	5,691	1,853	267	13,915
1980	1,488	4,656	5,691	1,812	267	13,915
1981	1,456	4,728	5,691	1,773	267	13,915
1982	1,425	4,797	5,691	1,735	267	13,915
1983	1,395	4,862	5,691	1,699	267	13,915
1984	1,367	4,925	5,691	1,664	267	13,915
1985	1,340	4,986	5,691	1,664	267	13,915
Inflated dollars (thousands)						
1976	1,791	4,756	6,243	2,181	293	15,264
1977	1,885	5,227	6,729	2,295	316	16,452
1978	1,943	5,620	7,102	2,366	333	17,364
1979	1,998	6,015	7,472	2,433	351	18,268
1980	2,049	6,410	7,834	2,494	368	19,154
1981	2,109	6,848	8,244	2,567	387	20,155
1982	2,192	7,378	8,755	2,669	411	21,405
1983	2,266	7,894	9,240	2,758	434	22,592
1984	2,348	8,458	9,773	2,858	459	23,894
1985	2,455	9,136	10,429	2,989	490	25,498

EQUIPMENT EXPENDITURE PROJECTIONS—Continued

Year	East less bank.	South	West less R.I.	Bank. East	R.I.	U.S. total
Highway revenue and miscellaneous equipment 1975-84 constant dollars (thousands)						
1976-85	8,272	15,019	20,990	771	28	45,080
Inflated dollars						
1976	8,667	15,738	21,994	808	29	47,237
1977	9,016	16,371	22,880	840	31	49,138
1978	9,295	16,877	23,587	866	31	50,657
1979	9,569	17,375	24,283	892	32	52,151
1980	9,838	17,862	24,964	917	33	53,614
1981	10,130	18,394	25,706	944	34	55,209
1982	10,475	19,020	26,582	976	35	57,089
1983	10,803	19,615	27,414	1,007	37	58,875
1984	11,152	20,250	28,300	1,040	38	60,779
1985	11,560	20,990	29,334	1,078	39	63,000
Work equipment, 1975 constant dollars (thousands)						
1976-85	3,558	6,749	10,430	1,153	196	22,086
Inflated dollars (thousands)						
1976	3,903	7,403	11,441	1,265	215	24,228
1977	4,207	7,979	12,331	1,364	232	26,113
1978	4,440	8,422	13,015	1,439	245	27,561
1979	4,672	8,860	13,693	1,514	258	28,996
1980	4,898	9,290	14,357	1,588	270	30,402
1981	5,154	9,775	15,107	1,671	284	31,991
1982	5,474	10,381	16,044	1,774	302	33,974
1983	5,777	10,957	16,933	1,873	319	35,859
1984	6,110	11,589	17,910	1,981	337	37,926
1985	6,521	12,366	19,112	2,114	360	40,472
Freight car and locomotive betterments 1975 constant dollars (thousands)						
1976	23,019	32,181	75,453	11,244	1,902	143,800
1977	22,899	33,062	74,284	11,552	2,002	143,800
1978	24,033	34,529	71,064	12,146	2,027	143,800
1979	23,627	37,430	70,264	10,611	1,868	143,800
1980	22,733	37,916	68,408	12,897	1,845	143,800
1981	21,480	38,228	68,791	13,379	1,922	143,800
1982	19,741	37,839	69,369	14,780	2,071	143,800
1983	18,475	38,288	73,567	11,396	2,074	143,800
1984	16,811	38,027	70,556	12,616	5,790	143,800
1985	15,952	38,252	69,367	12,489	7,739	143,800

EQUIPMENT EXPENDITURE PROJECTIONS—Continued

Year	East less bank.	South	West less R.I.	Bank. East	R.I.	U.S. total
			Inflated dollars (thousands)			
1976	25,252	35,302	82,772	12,335	2,087	157,748
1977	27,074	39,090	87,828	13,658	2,367	170,018
1978	29,991	43,090	88,681	15,158	2,529	179,449
1979	31,019	49,141	92,247	13,930	2,452	188,789
1980	31,292	42,193	94,166	17,754	2,540	197,945
1981	31,113	55,373	99,644	19,379	2,784	208,293
1982	30,367	58,207	106,708	22,736	3,185	221,203
1983	29,996	62,164	119,444	18,503	3,367	233,473
1984	28,867	65,300	121,160	21,664	9,943	246,934
1985	29,232	70,096	127,113	22,885	14,181	263,507

TABLE NO. 4A-2

BLS wholesale price indices for railroad equipment and motor vehicle and equipment, historical (1962-75) and projected (1976-85), 1974 = 100

	Railroad equipment	Motor vehicles and equipment
1962	59.2	76.3
1963	59.2	75.7
1964	59.2	76.1
1965	59.5	76.2
1966	59.6	76.3
1967	61.0	77.4
1968	52.9	79.6
1969	66.4	81.1
1970	70.3	84.1
1971	73.9	88.7
1972	78.6	91.3
1973	82.2	92.2
1974	100.0	100.0
1975	122.7	111.9
1976	134.6	117.3
1977	145.1	122.0
1978	153.1	125.7
1979	161.1	129.5
1980	168.9	133.1
1981	177.7	137.0
1982	188.8	141.7
1983	199.2	146.1
1984	210.7	150.9
1985	224.8	156.4

TABLE NO. 4A-3

Computations of cars installed projections

	Actual	Projected									
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Plain box											
Carloads ----------(000) ----------	3,161	3,330	3,321	3,069	2,952	2,906	2,922	2,780	2,694	2,538	2,479
Trips per year --------------------	11.4	14.0	13.5	13.1	12.6	12.1	11.6	11.1	10.6	10.1	9.5
Bad order rate ---(percent)-------	11.0	----------	----------	----------	----------	8.3 all yrs.	----------	----------	----------	----------	----------
Requirements------(000) ----------	[a]311.6	260.2	267.9	256.1	255.3	261.2	273.7	272.2	276.6	274.3	283.1
Proportion owned------------------	.977	.939	.926	.907	.891	.862	.838	.807	.780	.749	.727
Ownership----------(000) ----------	[a]304.4	244.4	248.0	232.3	227.5	225.2	229.4	219.7	215.9	205.3	206.0
Retirements--------(000) ----------	----------	22.1	20.2	18.6	17.8	17.2	15.7	14.9	14.3	13.7	13.3
Installations -------(000) ----------	----------	[b].46	[b].46	[b].46	[b].46	14.8	19.9	5.1	10.6	3.1	13.9
Equipped box											
Carloads ----------(000) ----------	1,955	2,399	2,496	2,541	2,609	2,715	2,753	2,792	2,821	2,822	2,896
Trips per year --------------------	13.7	15.1	14.9	14.6	14.3	14.1	13.8	13.5	13.3	13.0	12.8
Bad order rate ---(percent)-------	10.4	----------	----------	----------	----------	6.7 all yrs.	----------	----------	----------	----------	----------
Requirements------(000) ----------	[a]159.3	169.7	179.9	186.7	195.3	207.1	214.0	221.0	277.6	231.9	242.6
Proportion owned------------------	.995	.994	.993	.992	.991	.990	.989	.988	.987	.986	.985
Ownership----------(000) ----------	158.5	168.7	178.7	185.2	193.6	205.1	211.6	218.4	224.6	228.7	238.9
Retirements--------(000) ----------	----------	3.1	3.1	3.2	3.5	4.5	4.4	4.6	4.9	5.1	5.4
Installations -------(000) ----------	----------	13.4	13.1	9.7	11.9	16.0	11.0	11.4	11.1	9.2	15.6

See footnotes at end of table.

Computations of cars installed projections—Continued

	Actual	Projected									
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Covered hoppers											
Carloads------------(000) ------------	3,060	3,316	3,571	3,741	3,916	4,239	4,430	4,623	4,782	4,903	5,096
Trips per year ----------------------	15.2	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9
Bad order rate ---(percent)-------	5.7	------------	------------	------------	----------	3.7 all yrs.	----------	------------	------------	------------	------------
Requirements------(000) ------------	[a]213.5	203.7	219.4	229.8	240.6	260.5	272.2	284.1	293.8	301.3	313.1
Proportion owned------------------	.693	.681	.669	.657	.645	.633	.621	.609	.597	.585	.573
Ownership----------(000) ------------	[a]147.9	138.8	146.8	151.0	155.2	164.9	169.0	173.0	175.4	176.3	179.4
Retirements--------(000) ------------	------------	3.0	3.2	3.4	3.4	4.0	3.9	4.0	4.2	4.3	4.5
Installations -------(000) ------------	------------	[b]4.2	[b]4.2	[b]4.2	7.6	13.7	8.1	8.0	6.6	5.1	7.7
Open hoppers											
Carloads------------(000) ------------	8,229	9,010	9,281	9,151	9,312	9,769	10,172	10,628	10,974	11,137	11,693
Trips per year ----------------------	26.4	26.8	26.9	27.1	27.2	27.3	27.4	27.6	27.7	27.8	27.9
Bad order rate ---(percent)-------	4.8	------------	------------	------------	----------	4.5 all yrs.	----------	------------	------------	------------	------------
Requirements------(000) ------------	[a]327.4	352.3	361.0	354.1	358.6	374.4	388.2	403.9	415.3	419.8	439.1
Proportion owned------------------	.972	.971	.971	.970	.970	.969	.968	.968	.967	.967	.966
Ownership----------(000) ------------	[a]318.3	342.3	350.4	343.5	347.7	362.8	375.9	390.8	401.6	405.8	424.1
Retirements--------(000) ------------	------------	21.1	18.4	17.4	16.5	16.4	17.7	17.5	17.3	17.2	17.1
Installations -------(000) ------------	------------	45.1	26.6	10.5	20.7	31.5	30.8	32.5	28.1	21.3	35.5

See footnotes at end of table.

Computations of cars installed projections—Continued

	Actual	Projected									
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Flats											
Carloads (000)	2,765	3,587	3,816	3,915	4,035	4,309	4,397	4,497	4,591	4,619	4,771
Trips per year	22.1	29.9	30.5	31.1	31.6	32.2	32.7	33.3	33.8	34.4	35.0
Bad order rate (percent)	6.4					5.4 all yrs.					
Requirements (000)	[a]133.7	126.6	132.2	133.3	134.9	141.6	142.0	142.8	143.4	141.9	144.3
Proportion owned	.701	.700	.700	.700	.700	.700	.700	.700	.700	.700	.700
Ownership (000)	[a]93.7	88.6	92.6	93.3	94.4	99.1	99.4	100.0	100.4	99.4	101.0
Retirements (000)		6.3	5.3	4.7	4.4	3.9	3.8	3.7	3.6	3.5	3.4
Installations (000)		[b]1.2	[b]9.2	[b]5.4	5.6	8.6	4.1	4.3	4.0	2.5	5.0
Gondolas											
Carloads (000)	2,454	2,892	2,882	2,649	2,687	2,845	3,066	3,261	3,338	3,203	3,443
Trips per year	16.5	20.3	20.5	20.6	20.8	21.0	21.2	21.4	21.6	21.8	22.0
Bad order rate (percent)	7.3					6.2 all yrs.					
Requirements (000)	[a]160.4	152.2	150.2	136.8	137.4	144.1	153.9	162.2	164.4	156.4	166.6
Proportion owned	.971	.969	.968	.966	.965	.964	.962	.961	.959	.958	.956
Ownership (000)	[a]155.8	147.6	145.4	132.2	132.6	138.8	148.0	155.7	157.7	149.7	159.3
Retirements (000)		10.7	9.6	8.1	8.0	7.8	7.6	7.5	7.4	7.3	7.2
Installations (000)		[b]2.5	[b]7.5	5.8	[b]5.8	[b]5.8	[b]16.8	15.2	9.4	[b]8.0	[b]8.0

See footnotes at end of table.

Computations of cars installed projections—Continued

	Actual	Projected									
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Tank											
Carloads------------(000)------------	1,250	1,109	1,138	1,084	1,066	1,116	1,101	1,102	1,070	1,006	987
Trips per year----------------------	8.5	10.5	10.1	9.7	9.4	9.0	8.7	8.3	8.0	7.7	7.3
Bad order rate ---(percent)-------	9.3	------------	------------	------------	----------	6.0 all yrs.	----------	------------	------------	------------	------------
Requirements------(000)------------	[a]162.1	112.8	119.9	118.3	120.8	131.4	134.8	140.5	142.2	139.5	143.1
Proportion owned------------------	.017	.015	.014	.012	.010	.008	.007	.005	.003	.002	.000
Ownership----------(000)------------	[a]2.8	1.7	1.6	1.4	1.2	1.1	.9	.7	.5	.2	.0
Retirements--------(000)------------	------------	2.0	1.4	1.2	1.0	.9	.9	.8	.8	.8	.9
Installations -------(000)[c]----------	------------	------------	------------	------------	----------	------------	------------	------------	------------	------------	------------
Other											
Carloads------------(000)------------	695	771	787	767	771	787	800	809	819	795	806
Trips per year----------------------	23.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Bad order rate ---(percent)-------	4.7	------------	------------	------------	----------	4.3 all yrs.	----------	------------	------------	------------	------------
Requirements------(000)------------	[a]31.7	32.2	32.9	32.1	32.2	32.9	33.4	33.8	34.2	33.2	33.7
Proportion owned------------------	.913	.908	.903	.898	.893	.888	.883	.878	.873	.868	.863
Ownership----------(000)------------	[a]28.9	29.3	29.7	28.8	28.8	29.2	29.5	29.7	29.9	28.8	29.1
Retirements--------(000)------------	------------	.9	.7	.5	.5	.4	.3	.3	.3	.3	.2
Installations -------(000)------------	------------	------------	------------	------------	----------	------------	------------	------------	------------	------------	------------

See footnotes at end of table.

Computations of cars installed projections—Continued

	Actual	Projected									
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Refrigerator											
Carloads------------(000)------------	931	1,088	1,093	1,071	1,065	1,063	1,076	1,085	1,095	1,067	1,074
Trips per year----------------------	10.3	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Bad order rate ---(percent)-------	5.6	------------	------------	------------	----------	3.4 all yrs.	----------	------------	------------	------------	------------
Requirements------(000)------------	[a]95.8	93.8	94.3	92.4	91.9	91.7	92.8	93.6	94.4	92.0	92.6
Proportion owned-----------------	.725	.761	.797	.833	.869	.905	.941	.977	1.000	1.000	1.000
Ownership----------(000)------------	[a]69.4	71.4	75.2	77.0	79.9	83.0	87.3	91.5	94.4	92.0	92.6
Retirements--------(000)------------	------------	2.6	2.7	2.7	2.8	2.9	3.0	3.2	3.2	3.3	3.4
Installations -------(000) -----------	------------	4.6	6.5	4.5	5.7	6.0	7.4	7.3	6.2	.9	4.0
Total installations----(000)------------	------------	71.4	67.5	40.6	57.6	96.4	98.0	89.7	75.9	50.2	89.8

[a] Adjusted to conform to basis of trips per year figures, as discussed in text.

[b] Annual average of installations for time span which would include negative installations given computation procedures being followed; adjacent years with postive installations are included so that the annual averages are positive.

[c] Not estimated.

TABLE NO. 4A-4

Regression results and other projection bases

1. PRICE INDICES

$$WPI_{RE} = -.10444 + .7291WPI_{IC}$$

$$(.0249)$$[a]

$$R^2 = .987$$

$$\ln (WPI_{MV}) = -.26786 + .47265 \ \ln (WPI_{IC}) + .006694t$$

$$(.09596) \qquad\qquad (.003482)$$

$$R^2 = .961$$

WPI_{RE} = BLS wholesale price index—railroad equipment, 1974 = 1.000

WPI_{IC} = BLS wholesale price index—industrial commodities, 1974 = 1.000

WPI_{MV} = BLS wholesale price index motor vehicles and equipment, 1974 = 1.000

t = time (= 1,1962)

2. TRIPS PER YEAR

Plain boxcars

$$T = 19.85 - .171t - .00678t^2$$

$$(.149) \quad (.00848)$$

$$R^2 = .841$$

Estimating equation is for total boxcars; projection for plain is obtained as T-0.2

---

[a] Where shown, numbers in parentheses are standard errors of regression coefficients.

Equipped boxcars

$\ln(T) = 2.94144 - .019267t$

$R^2 = .753$

$t = 1,1964$

Estimating equation is for total boxcars; projection for equipped is obtained as T+0.4.

Open hopper

$\log_{10}T = 1.29423 + .10445 \log_{10}t$

$R^2 = .785$

Covered hopper

Found to have flat trend; 1971-74 average of 16.9 selected.

Gondola

$T = 16.49 + .198t$

$R^2 = .542$

Flat

$\log_{10}T = 1.26494 + .19248 \log_{10}t$

$R^2 = .757$

Regression was used only to obtain 1985 projection; projections for 1975-83 are linear interpolations from the 1971-1974 average to the 1985 projection.

Refrigerator

Found to have flat trend, judged graphically at around 12.0

Tank

$T = (42.9)(.99)^t - 25.7$

$t = 1,1960$

(Modified exponential curve, not fit by regression analysis)

Other

Found to have flat trend, judged graphically at around 25.0

T = Trips per year
t = time (=1-1958, unless otherwise specified)

3. CARLOADS

Plain boxcars

$$\ln C = .60119 - .01513t + 1.08079 \ln C_P$$

(.00151) (.28850)

$$R^2 = .908$$

t = 1, first quarter 1969

Equipped boxcars

$$\ln C = 8.82089 = .0029t + .35012 \ln C_{TE}$$

(.0014) (.05646)

$$R^2 = .727$$

t = 1, first quarter 1969

Open hopper

$$C = -.8711 + \underset{(.00549)}{.01571}\ T_{11} + \underset{(.01598)}{.03133}\ T_{14} \underset{(.0377)}{-.1697t}$$

$$R^2 = .94$$

Covered hopper

$$C = -.18083 + \underset{(.00842)}{.00763T_{28}} + \underset{(.00817)}{.01394T_{32}} + \underset{(.03144)}{.14228t}$$

$$R^2 = .995$$

Gondola

$$C = -1.971 + \underset{(.00772)}{.02987T_{14}} + \underset{(.00524)}{.00322T_{33}} - \underset{(.02373)}{.03275t}$$

$$R^2 = .94$$

Flat

$$C = .3743 + \underset{(.03308)}{.01555T_{24}} + \underset{(.02519)}{.02393T_{37}} + \underset{(.09101)}{.06553t}$$

$$R^2 = .90$$

Refrigerator

$$\text{Ln } C = -5.12577 + \underset{(.28971)}{.52116} \ln P_m - \underset{(.00778)}{.00678t}$$

$$R^2 = .45$$

Tank

$$C = .8386 + \underset{(.00555)}{.01315T_{28}} - \underset{(.02031)}{.08184t}$$

$$R^2 = .87$$

Other

$$C = .2771 + \underset{(.00040)}{.00053T_T} - \underset{(.00811)}{.02409t}$$

$$R^2 = .59$$

C = Carloads for type of car in question

t = 1,1964 unless otherwise noted

C_p = Carloads of paper and paper products (source: AAR)
Projected on the basis of percentage changes in projected tons originated (table 1-8) and in projected tons per car for paper traffic (developed as part of Forecast Methodology No.2).

C_{TE} = Carloads of transportation equipment (source: AAR)
Projected on basis similar to that of Cp.

P_m = Constant dollar value of shipments, meat (SIC 2011, 2013, 2015) projected by relating the series to food products production (SIC 20) by regression and using Data Resources, Inc., forecasts for the latter.

T = Tons originated, subscript indicates STCC commodity code (except for T, standing for total):

10 - metallic ores
11 - coal
14 - nonmetallic minerals
20 - food
24 - lumber
28 - chemicals
32 - stone, clay
33 - primary metals
37 - transportation equipment

4. HISTORICAL TRENDS IN SHARES OF CARS AND LOCOMOTIVES INSTALLED

East less Bankrupts

S_L = 1966-74 av. (.115)

S_C = 1972-74 av. (.140)

South

$$S_L = .10088 + .013628t$$

$$R^2 = .375$$

$$S_C = .14191 + .011096t$$

$$R^2 = .71$$

West less Rock Island

S_L = 1962-74 av. (.409)

$$S_C = .28083 + .014072t$$

$$R^2 = .457$$

Bankrupt East

S_L = 1962-74 av. (.140)

S_C = 1969-74 av. (.090)

Rock Island

S_L = 1962-74 av. (.0192)

$$S_C = .008469 + \underset{(.0009895)}{.0016393t}$$

t = 1, 1962

$R^2 = .217$

S_L = Proportional share of U.S. total locomotives installed

S_C = Proportional share of U.S. total freight cars installed

5. TON-MILES PER CAR ON LINE

East less Bankrupts

1971, 1973, 1974 average (.4313)

South

$Tms/Col = .4536 + .012t$

$R^2 = .77$

West less Rock Island

$$Tms/Col = .504 + \underset{(.0112)}{.0286t} - \underset{(.00090)}{.00064t^2}$$

$R^2 = .896$

Bankrupt East

$Tms/Col = .4081 + .00642t$

Not fit by regression

t = 1,1974

.4081 = 1972-74 average

.00642 = [(1972-74 average)-(1968-70 average)] ÷ 4

Rock Island

1966-74 average (.7453)

t = 1,1964 unless otherwise noted

6. CARS ON LINE TO OWNERSHIP RATIOS

East less Bankrupts

$$C/O = .8096 + .01882t$$

$$R^2 = .696$$

South

1964-74 average (.959)

West less Rock Island

1964-74 average (.928)

Bankrupt East

1964-74 average (1.129)

Rock Island

$$C/O = .8764 + .01215t$$

$$R^2 = .26$$

C/O - Cars on line to ownership ratio for particular group

t = time (= 1-1964)

7. LOCOMOTIVE PROJECTION FACTORS

Car-miles

$$CM = 9038 + \underset{(.102)}{.648\ CLS} + \underset{(59.2)}{435.6t}$$

$$R^2 = .90$$

Locomotive-miles per locomotive in service

$$LM/L = 76749 - \underset{(857.1)}{2646.8t} + \underset{(83.61)}{111.45t^2}$$

$$R^2 = .918$$

Switching-miles

$$SM = 86.395 + \underset{(.00175)}{.00462}\, CLS + \underset{(1.0126)}{.7957}t$$

$R^2 = .72$

Switching-miles per yard locomotive

$SM/L = 42869 + 1770.6t$

$t = 1\text{-}1974$

42869 = 1973 value of SM/L

1770.6 = average annual increase in series

Not estimated by regression.

CLS = Total carloads

t = Time (=1-1965 except where noted)

All dependent variables stand for title headings under which respective equations are shown.

TABLE NO. 4A-5

Cost per unit installed (1974 dollars), and proportion rebuilt, freight cars, cabooses, and locomotives, 1976-85

	Cost new	Cost rebuilt	Proportion rebuilt
Plain box	20,570 (1962-74 av.)	[a]11,769 - 13,236 ($\ln C = 8.6962 - 3.37 \ln(t) + 1.81 \ln(t^2)$) $R^2 = .630$	.3738 (1969-74 av.)
Equipped box	27,300 (1969-74 av.)	12,759 (1970-74 av.)	.09524 (1971-74 av.)
Open hopper	18,875 (modified exponential fit, not by regression).	10,258 (1966-74 av.)	.1711 (1968-74 av.)
Covered hopper	[a]20,422 - 15,915 [b]($C = 26268 - 389.7t$ $R^2 = .773$)	12,850 (1962-74 av. excl. 1963)	.00381 (1972-74 av.)
Gondola	20,239 (1971-74 av.)	[a]9,640 - 7,242 ($C = 13103 - 266.4t$ $t = 1$, 1964 $R^2 = .194$)	[a] .123 - .097 ($C = .08812 + .2342 (.8638)^t$ not fit by regression)
Flat	25,591 (1968-74 av.)	14,468 (1972-74 av.)	.05437 (1962-74 av.)
Refrigerator	39,661 (1962-73 av.)	----------	----------
Locomotives	368,695 (1962-74 av.)	211,862 (1962-74 av.)	.1371 (1971-74 av.)
Cabooses	32,252 (1962-74 av. excl. 1969)	20,679 (1966-74 av.)	.2678 (1962-74 av.)

[a] Range shown is for 1976 and 1985 values of projected series, respectively.

[b] $t = 1$, 1962 for regressions shown unless otherwise noted.

TABLE NO. 4A-6

East less bankrupts—Analysis of shares of cars installed

	Tms.	Tms./ C.o.l.	C.o.l.	C.o.l./ Own.	Own.	Adj. own.	Rets.	Installns.
1975 -----	----------	---------	---------	------------	------------	286.3	------------	------------
1976 -----	125.0	0.431	289.8	1.061	273.2	278.4	19.7	[a]11.8
1977 -----	134.9	.431	312.8	1.075	290.9	285.8	17.3	[a]24.7
1978 -----	139.3	.431	323.0	1.090	296.4	282.1	16.2	[a]12.5
1979 -----	144.0	.431	333.9	1.104	302.4	284.8	15.4	18.2
1980 -----	153.6	.431	356.1	1.118	318.5	295.1	14.8	25.1
1981 -----	161.4	.431	374.2	1.132	330.5	302.6	14.4	21.9
1982 -----	166.0	.431	384.9	1.146	335.8	304.3	14.1	15.8
1983 -----	169.9	.431	393.9	1.160	339.6	303.2	13.9	12.8
1984 -----	162.6	.431	377.0	1.174	321.2	294.9	13.7	5.5
1985 -----	165.5	.431	383.7	1.187	323.2	295.8	13.7	14.6

[a] Average of adjacent years that would otherwise show negative installations for 1 year.

Notes: For tables 4A-6-10, column heading abbreviations stand for the following:

Tms.—Revenue ton-miles (billions)
Tms./C.o.l.—Ton-miles (billions) per railroad owned cars on line (thousands)
C.o.l.—Cars on line (thousands), railroad owned
C.o.l./Own.—Cars on line to ownership ratios
Own.—Ownership as computed from preceding columns (thousands)
Adj. Own.—Ownership as adjusted to agree with U.S. total cars installed estimates (thousands)
Rets.—Retirements (thousands)
Installns.—Installations (thousands)

Figure shown under "Adj. Own." for 1975 is the average ownership level during 1975 as computed from AAR form CS-8A.

TABLE NO. 4A-7

South—Analysis of shares of cars installed

	Tms.	Tms./ C.o.l.	C.o.l.	C.o.l./ Own.	Own.	Adj. own.	Rets.	Installns.
1975 -----	------------	------------	------------	------------	------------	283.1	------------	------------
1976 -----	152.3	0.610	249.8	0.965	258.9	263.8	16.7	[a]6.1
1978 -----	164.5	.622	264.6	.961	275.4	270.6	10.6	[a]6.1
1978 -----	168.4	.634	265.8	.957	277.7	264.3	9.9	[a]6.1
1979 -----	173.6	.646	268.9	.953	282.1	265.7	9.7	11.1
1980 -----	184.2	.658	280.1	.949	295.1	273.4	9.6	17.3
1981 -----	193.2	.670	288.5	.945	305.2	279.4	9.6	15.6
1982 -----	200.5	.682	294.2	.942	312.4	283.0	9.8	13.5
1983 -----	206.9	.694	298.3	.938	318.1	283.9	10.0	10.9
1984 -----	200.6	.706	284.3	.934	304.3	279.4	10.2	5.7
1985 -----	208.6	.718	290.7	.930	312.4	286.0	10.6	17.1

See note, table No. 4A-6.

[a] Average for adjacent years that would otherwise show negative installations for 1 year.

TABLE NO. 4A-8

West less Rock Island—Analysis of Shares of Cars Installed

	Tms.	Tms./ C.o.l.	C.o.l.	C.o.l./ Own.	Own.	Adj. own.	Rets.	Installns.
1975	------------	------------	------------	------------	------------	577.7	------------	------------
1976	415.3	0.768	541.0	0.934	579.4	590.4	40.9	53.6
1977	452.9	.779	581.4	9.30	625.2	614.3	33.4	57.3
1978	471.9	.789	598.1	.926	645.8	614.6	30.1	30.4
1979	489.7	.798	613.8	.922	665.5	626.8	28.0	40.2
1980	523.5	.805	650.1	.919	707.7	655.6	26.6	55.5
1981	551.6	.811	679.8	.915	743.0	680.2	25.4	49.9
1982	579.2	.816	709.5	.911	778.6	705.5	24.6	49.9
1983	608.4	.820	742.0	.908	817.5	729.7	23.8	48.1
1984	596.8	.822	725.7	.904	802.8	737.1	23.1	30.4
1985	625.0	.823	759.0	.900	843.0	771.6	22.5	57.0

See note, table No. 4A-6.

TABLE NO. 4A-9

Bankrupt East—Analysis of shares of cars installed

	Tms.	Tms./ C.o.l.	C.o.l.	C.o.l./ Own.	Own.	Adj. own.	Rets.	Installns.
1975	------------	------------	------------	------------	------------	217.7	------------	------------
1976	100.3	0.427	234.7	1.136	206.6	210.5	9.3	[a]2.1
1977	104.1	.434	240.0	1.131	212.1	208.4	8.6	[a]6.5
1978	102.1	.440	231.9	1.127	205.9	195.9	6.9	[a]3.7
1979	104.2	.447	233.3	1.122	207.9	195.8	7.2	[a]3.7
1980	107.7	.453	237.7	1.118	212.7	197.1	8.4	[a]3.7
1981	112.2	.459	244.2	1.113	219.4	200.8	8.9	12.7
1982	113.1	.466	242.8	1.109	219.0	198.4	8.8	6.4
1983	114.2	.472	241.8	1.104	219.0	195.5	8.8	5.9
1984	107.3	.479	224.1	1.100	203.8	187.1	8.8	0.4
1985	109.8	.485	226.3	1.095	206.6	189.1	8.8	10.8

[a] Average of adjacent years that would otherwise show negative installations for 2 years.

See note, table No. 4A-6.

TABLE NO. 4A-10

Rock Island—Analysis of shares of cars installed

	Tms.	Tms./ C.o.l.	C.o.l.	C.o.l./ Own.	Own.	Adj. own.	Rets.	Installns.
1975						26.3		
1976	19.1	0.745	25.6	1.043	24.6	25.0	2.0	[a]0.7
1977	19.7	.745	26.4	1.051	25.2	24.7	1.4	[a]1.1
1978	19.3	.745	25.9	1.059	24.5	23.3	1.3	[a].8
1979	19.6	.745	26.3	1.066	24.7	23.2	1.2	.8
1980	20.3	.745	27.2	1.074	25.4	23.5	1.1	.8
1981	20.8	.745	27.9	1.082	25.8	23.6	1.1	1.2
1982	21.2	.745	28.4	1.089	26.1	23.7	1.1	1.1
1983	21.6	.745	29.0	1.097	26.4	23.6	1.0	.9
1984	20.7	.745	27.8	1.104	25.2	23.1	1.0	.5
1985	21.1	.745	28.3	1.112	25.5	23.3	1.0	9.9

[a] Average for adjacent years that would otherwise show negative installations for 1 year. See note, table No. 4A-6.

TABLE NO. 4A-11

Analysis of shares of cars installed—reconciliation of two approaches

	1976	1980	1985
East less bankrupts:			
H	0.132	0.120	0.107
R/T	.215	.235	.132
A	.178	.180	.117
South:			
H	.290	.301	.313
R/T	.072	.158	.150
A	.186	.233	.227
West less R.I.:			
H	.463	.468	.474
R/T	.652	.524	.575
A	.574	.504	.514
Bankrupt east:			
H	.085	.077	.069
R/T	.051	.072	.074
A	.051	.072	.074
Rock Island:			
H	.031	.034	.037
R/T	.011	.010	.069
A	.011	.010	.069

Notes: H—Historical shares trend.

R/T—Trend based on traffic, retirement information.

A—Figures adopted.

Computations were carried out for 10 years of projected series; only three are shown for illustrative purposes.

best copy available

TABLE NO. 4A-12

Projection of locomotives installed

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Road locomotive miles per road locomotive in service	61,036	61,176	61,538	62,123	62,931	63,962	65,216	66,693	68,393	70,316
Road locomotive miles	1,395.9	1,439.7	1,447.5	1,478.5	1,535.1	1,581.3	1,624.5	1,660.5	1,676.8	1,728.3
Required fleet of road locomotives	22,870	23,534	23,523	23,799	24,393	24,723	24,910	24,898	24,517	24,580
Locomotive switching miles	223.14	228.02	226.99	229.75	236.72	242.00	246.77	250.36	250.73	256.87
Switching miles per yard locomotive	48,181	49,951	51,722	53,493	55,263	57,034	58,804	60,575	62,346	64,116
Required fleet of yard locomotives	4,631	4,565	4,389	4,295	4,284	4,243	4,196	4,133	4,022	4,006
Total locomotive fleet required[1]	27,501	28,099	27,911	28,094	28,676	28,966	29,106	29,031	28,539	28,586
Retirements	1,439	1,417	1,449	1,357	1,303	1,276	1,245	1,214	1,189	1,167
Installations	2,381	2,015	1,261	1,539	1,885	1,566	1,385	1,139	697	1,214

[1] Actual 1975 comparable fleet size: 26,559.

Forecast Methodology No. 4B

ROADWAY FACILITY EXPENDITURES

This section explains the projections (shown in table 4B-2) of roadway facility expenditures for the 1976-85 period of an inflated and constant 1975 dollar basis.

The projections were made separately for 21 separate roadway accounts which were aggregated in order to show railroad group totals.

For each roadway facility account, projections were based upon three separate elements: (1) an analysis of constant dollar 21-year levels of expenditures in order to project replacement and betterment outlays; (2) a projection of future growth or decline by account, based upon forecasts of traffic growth and assuming a continuation of recent trends in technological substitutions; and (3) delayed capital improvements drawn from Ex Parte No. 305 submissions which were annualized over a 10-year period.

Replacement and betterment expenditures.—The general procedure was to calculate 20-year, and most recent 10-year and 3-year annual averages from which a constant dollar investment level was selected to represent a "normalized" level of expenditures based upon a review of the changes occurring over the periods in each account. A summary of these changes which served as a basis for this selection appears at the end of this forecast methodology. The average selected served as the replacement expenditure level for each of the years 1976-1985. Selection of the underlying data and the development of cost indices is described next.

Gross capital expenditures for roadway facility series by account and by district were taken from ICC *Transport Statistics in the United States* for the years 1954-72. These were drawn from the totals of "expenditures for additions and betterments during the year" made on owned and leased property (Table 138, Investment in Road and Equipment Property: Changes—By Primary Account and by District). Expenditures during the year made for the purchase of existing lines and line extensions were excluded because the former represent ownership changes within regions and the latter are assumed to be insignificant during the forecasted period. To the extent that line extensions represent a restructuring of existing plant as a result of yard consolidations, abandonments or for other reasons, line extension expenditures are a substitute for addition and betterment expenditures.

Adjustments to these series were required because of the merging of the Pocahontas district with the eastern district after 1965, and the consolidation of "underground power tubes" (account 4) with "tunnels and subways" (account 5), and "crossings and signs" (account 15) with "signals and interlockers" (account 27). Track structure betterments (accounts 1-3, 8-12) were estimated separately and are not included in roadway facilities. In addition, roadway small tools (account 38) were excluded because almost all such expenditures are expensed under the most recent $1,500 capitalization rule which governs whether a unit is capitalized or expensed.

Figures for 1973 and 1974 were drawn from individual railroad reports filed in Ex Parte No. 305. (Third and fourth quarter 1974 figures were railroad estimates.) Comparable series for the omitted railroads were drawn from individual railroad annual reports and subtracted from district totals. This procedure required that data on merged railroads be accumulated separately for the period prior to each merger.

Cost indices were developed for each account by district (for building accounts: 16-20, and for accounts 21-24, 29, 35) and U.S. average (accounts 6, 13, 26, 27, 31, 37, 39, 44, 45, and 57). For the period 1954-67 the ICC cost indices were used. Regional indices calculated for valuation purposes were consolidated into the present three regions by taking simple averages. Extrapolations of the ICC indices for the period 1968-1973 were made using the following indices:

Engineering News-Record Cost Index:

Building	16, 24, 29, 31, 45
Construction	6, 39
Electrical machinery and equipment	26
Switchgear and switchboard	27
Transportation equipment	37
Metal working machinery and equipment	44
Free hand extrapolation of ICC index	13, 57

The Engineering News-Record building index was adjusted for individual building accounts by the following procedure. Each ICC index for accounts 16-24, 31, and 35 was compared with the ENR building index over the period 1964-67. A ratio of total percent change of ICC index to total percent change of ENR building index was used to adjust the ENR index for each building account by district. ICC cost indices are based on 1910-14 dollars. Once extrapolations were calculated to 1973, the base was converted to 1974 dollars. These indices were then used to express 1954-1972 expenditures in 1974 dollars.

Growth trends for selected accounts.—Expenditures for some property accounts show growth historically or they can be expected to grow based on anticipated increases in coal traffic. These accounts and the basis of growth trends selected for them are shown in table 4B-1. Growth trends based on commodity tonnage or carloading data are given effect by applying successive proportional changes in the projected traffic series from year to year to a base year replacement level for the account in question. Projected growth trends for these accounts were selected from (1) an analysis of the constant dollar trends in each account, and (2) a review of railroad capital project information filed quarterly since July 1971, in compliance with Ex Parte No. 267.

TABLE 4B-1

Account:	
6 Bridges	[a]
24 Coal and Ore Wharves	[a]
25 TOFC/COFC	[a] and [b]
26 Communications	4% [d]
27 Signals and Interlockers	2.4% [c]
37 Roadway Machines	4% [d]

---

[a] Based upon projected U.S. tons originated of coal (see table 1-8).
[b] Based upon projected flat car loadings (see table 4A-3).
[c] Based upon twice the historic growth rate of miles of CTC systems, 1965-69.
[d] Based upon historic growth in the expenditure series.

Delayed capital improvements.—Detailed breakdowns of delayed capital improvements as of June 30, 1974, were reported by the railroads in Ex Parte No. 305. Expenditures for deferred projects are assumed to be in addition to projected normalized levels of investment required to maintain capacity. It was assumed that a constant 10-year period of expenditure would be required to complete the deferred roadway facility projects. Thus, reported total deferred capital projects were annualized over a 10-year period at a constant level.

Conversion to constant 1975 and inflated dollars.—For practicable conversion of the constant 1974 dollar projections to constant 1975 and inflated dollars, it was necessary to aggregate the price indices that were used, as discussed earlier, to construct the long constant dollar historical series for the various roadway facility property accounts. These indices were aggregated, for each district, into three series corresponding to different groups of accounts, the grouping based primarily on estimated service life for each property account. This grouping was designed for purposes of repricing property retired on a constant 1974 dollar basis; the results of that application of the aggregate indices are discussed below.[31] The grouping was accomplished by using weights based on 1966-74 cumulative expenditures for each account. Next, industry aggregate indices were constructed out of the district indices again using weights based on 1966-74 cumulative expenditures. In order to obtain projections for each of the industry aggregate indices the historical series (1960-74) were related by regression analysis to corresponding, more general indices for which long range projections were available from Data Resources, Inc.[32] The projected aggregate industry indices are shown in table 4B-3, and the regional weights used to construct them as well as the regression results are shown in the notes to table 4B-3. The projected indices were combined into one index covering all roadway facilities for purposes of final conversion of the constant 1974 dollar expenditure projections into constant 1975 and inflated dollar terms.[33] The weights used to combine them, shown in the notes to table 4B-3, were based on the 1966-74 cumulative expenditures for each group of accounts.

Comparison with constant dollar retirements.—The computerized simulation technique used to derive estimates of 1976-85 roadway facility retirements are discussed in Forecast Methodology No. 8. These techniques produce estimates of the age distribution of retirements which, combined with the various price indices discussed above, can be used to obtain retirements in 1974 constant dollars. This was done with a view to possible use of these retirement figures as the estimates of roadway facility investment. Such investment is largely in the nature of replacement investment, and the underlying premise was that when converted to constant dollars, retirements would follow the time pattern of expenditures for additions and betterments. Table 4A-4 shows that estimates obtained for 1974 dollar retirements of roadway facilities for three railroad groups (1976-84). Large discrepancies were found, however, between these results and the estimates of capital expenditures discussed above, discrepancies so large as to raise doubts about the foregoing premise. In fact, a cursory examination showed so little correspondence between historical series of original cost dollar retirements and expenditures for additions and betterments of roadway facilities, that it was unlikely that conversion of retirements to constant dollars would make the difference. Consequently, the capital expenditure estimates adopted were those obtained by the procedures described earlier.

---

[31] The aggregate indices each correspond respectively to the following grouping of accounts:

(a) Account Nos. 1, 6, 7, 16, 20, 21, 22, 23, and 24.

(b) Account Nos. 13, 17, 18, 19, 29, and 35.

(c) Account Nos. 26, 27, 31, 37, 44, and 45.

[32] Namely, the Department of Commerce, Bureau of Economic Analysis, implicit price deflators for private nonresidential structures and private fixed investment.

[33] Conversion to 1975 constant dollars was achieved by substituting in the regression equations shown in table 4B-3 actual 1975 values of the price indices; used as independent variables in those regression equations.

Nonetheless, a comparison between the two sets of results is instructive. Consider the following figures representing estimates of 1979 roadway facility capital expenditures in millions of 1974 dollars:

	Simulated retirement technique	Analysis of additions and betterments approach[a]
East less bankrupts and ConRail	64.1	46.6
South	38.3	58.9
West less R.I.	104.0	143.3

[a] Excludes delayed capital improvements portion (which is included in the projections shown in table 4B-2).

The simulated retirement technique measures in effect the length of time between writing of property acquired into the investment accounts and writing of property retired out of the investment accounts. If constant dollar retirements were to appear too *high* relative to trends in addition and betterment expenditures, it could be because (a) items retired and written out of the property accounts are not being replaced on railroads that are declining or have declined and are now stagnant, or (b) a repricing of old investment overestimates the amount now required with more advanced technology to perform the same function.

Only the eastern group fits the foregoing pattern. For the southern and western groups, constant dollar retirements appear too *low* relative to trends in addition and betterment expenditures. Possible explanations are that (a) the road or roads in question may be growing and investment is undertaken to expand capacity as well as for replacement (apparently the case with the South), or (b) replacement investment is being undertaken without actually physically disposing of property being replaced or writing it out of the investment accounts (probably the case with the West, since there is no evident long-term trend toward capacity expansion as in the South).

TABLE 4B-2

Capital expenditures for roadway facilities (thousands of dollars)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
East less bankrupt lines:										
Constant 1975 dollars	54,498	55,655	56,533	57,441	58,678	59,695	60,846	62,029	63,250	64,552
Inflated dollars	56,189	60,003	63,431	66,289	69,656	73,112	76,645	80,378	84,894	89,289
Southern district:										
Constant 1975 dollars	79,794	81,560	82,873	84,240	86,147	87,648	89,340	91,075	92,826	94,761
Inflated dollars	82,270	87,932	92,985	97,214	102,264	107,347	112,536	118,017	124,591	131,074
West less Rock Island:										
Constant 1975 dollars	186,823	190,476	193,321	196,268	200,204	203,467	207,119	210,873	214,720	218,862
Inflated dollars	192,621	205,357	216,908	226,498	237,659	249,198	260,900	273,254	288,198	302,732

TABLE 4B-3

Projected price indices for roadway facilities (1974 = 1.00)

	(a)	(b)	(c)
1976	1.0804	1.0431	1.0834
1977	1.1256	1.0714	1.1414
1978	1.1669	1.0970	1.1963
1979	1.1951	1.1143	1.2382
1980	1.2266	1.1334	1.2794
1981	1.2626	1.1551	1.3262
1982	1.2927	1.1729	1.3729
1983	1.3272	1.1934	1.4178
1984	1.3701	1.2188	1.4765
1985	1.4042	1.2383	1.5331

Notes

1. Groups of property accounts corresponding to each series are as follows:

(a) Property accounts 1, 6, 7, 16, 20, 21, 22, 23, and 24.
(b) Property accounts 13, 17, 18, 19, 29, and 35.
(c) Property accounts 26, 27, 31, 37, 44, and 45.

2. Weights used to combine these series for index covering all facilities are:

(a) .4004
(b) .1232
(c) .4764

3. Weights used to derive the aggregate index for each group of accounts from the regional indices are as follows:

	(a)	(b)	(c)
East	.1905	.2823	.1868
South	.2955	.1591	.2437
West	.5139	.5586	.5695

4. Regression equations used to project the indices are as follows:

$$\text{(a) } \log(I_r) = \underset{(.00680)}{6.40018} + \underset{(.020308)}{.451534} \log(I_{ns})$$

$$R^2 = .972$$

$$\text{(b) } \log(I_r) = \underset{(.00322)}{6.33770} + \underset{(.009610)}{.295422} \log(I_{ns})$$

$$R^2 = .985$$

$$\text{(c) } \log(I_r) = \underset{(.00644)}{6.25380} + \underset{(.026918)}{.630917} \log(I_{fi})$$

$$R^2 = .975$$

Numbers in parenthesis are standard errors of regression coefficients.

I_r = Price index (1910-14=100) for property account group in question.

I_{ns} = Implicit price deflator (1972 = 1.00) for private non-residential structures.

I_{fi} = Implicit price deflator (1972 = 1.00) for private fixed investment.

TABLE 4B-4

Class I line haul R.R.—excluding bankrupts—renewals—road property—1974 constant dollars starting age distribution—12/31/74

ROAD PROPERTY—(THOUSANDS)

	Years								
	1976	1977	1978	1979	1980	1981	1982	1983	1984
East less bankrupts and ConRail	$61,928	$62,672	$63,404	$64,134	$64,872	$65,619	$66,370	$67,141	$67,931
South	36,718	37,270	37,798	38,299	38,774	39,221	39,640	40,032	40,397
West less R.I.	100,158	101,512	102,798	104,009	105,139	106,184	107,137	107,994	108,746

SUMMARY OF CHANGES IN COMPOSITION OF PRIMARY ACCOUNTS

Account 16 Station and Office Buildings:

The majority of investments in this account are related to office buildings. But this also includes station buildings and terminals associated with passenger service, agent station buildings, and freight transfer sheds. Agent station buildings were used for billing and auditing functions, or other functions which have been centralized. These buildings generally have been converted to other uses. Transfer sheds carried LCL traffic which has become relatively insignificant. Computers are in account 16 now and constitute a significant component. Railroads are now required to carry computers in a subaccount.

Account 17 Roadway Buildings:

The account originally contained section gang dwellings which have been replaced by mechanized equipment. It now contains factories, frog, welding, and other shops. Section dwelling houses are still listed in the account description although presumably they have been transferred to storage facilities.

Account 18 Water Stations:

This account was set up to record the cost of constructing water stations for the purpose of supplying locomotives with water, and included the cost of windmills, pumps, boilers, pumphouses, tanks, wells, dams, reservoirs, or cisterns, et cetera. It did not include the costs of general water supply facilities for other uses. Where these facilities still exist, they generally have been converted to use for fire protection.

Account 19 Fueling Stations:

For steam locomotives this account contained investments in coal platforms, sheds and pocket chutes, and related facilities. With the transition to diesel technology, new investments are for diesel fuel stations (fuel houses) and related diesel facilities.

Account 20 Shops and Enginehouses:

This account included roundhouses, turntables, and other steam locomotive facilities. Some of those remaining were converted to other uses, such as warehouses and other storage facilities. This account now contains car repair and spot and renovation facilities; which are associated with dieselization.

Account 5 Tunnels and Subways *and Account 6* Bridges:

Activity in these accounts reflects the use of larger and heavier freight cars and locomotives, requiring changes in the size and strength of structures.

Account 23 Coal and Ore *and Account 24* Wharves and Docks:

There has been little change in these accounts which have been generally stable.

Account 26 Communications Systems:

Since World War II, there has been a switch from aerial wire to microwave facilities. Telegraph poles and wires largely have been replaced. However, further technological changes in communications are likely.

Account 27 Signals and Interlockers:

There have been rapid changes in technology in CTC, Hump and Saucer yards, retarders, power interlockers controlled from yard offices, and related facilities.

Account 25 TOFC/COFC:

This account was created in 1974 from accounts 16, 35, and 58. Unlike other accounts, investment in TOFC/COFC facilities was related entirely to traffic.

Account 37 Roadway Machines:

The separation rule distinguishes roadway machines from floating equipment on the grounds of whether it can be hauled by rail. The trend toward mechanized roadway maintenance is reflected by the growth in this account.

Account 38 Small Tools and *Account 44* Shop Machinery:

Small tools generally fall under the $1,500 accounting rule for treatment as an expense item. Shop machinery has undergone a tremendous change in composition. A significant amount of shop machinery is expensed rather than depreciated.

Account 29 Power Plants, *Account 35* Miscellaneous Structures, *Account 39* Public Improvements, and *Account 48* Power Plant Machinery:

These accounts do not have significant investment activity. Power plant buildings and machinery have declined as railroads substituted municipal services for their own. Accounts 35 and 39 are *de minimus* in size.

Forecast Methodology No. 5

TRACK STRUCTURE ADDITIONS AND BETTERMENTS, AND CREDITS FOR TRACK RETIRED

Track structure expenditures for additions and betterments were computed as constant proportions of track materials expense and track labor expense (shown in table 5-1). Schedule 211 of the R-1 Annual Report (for additions and betterments expenditures) and schedule 320 (for operating expenses) served to develop these proportions.[34] Averages for years 1971-74 (for which data were available in the project's computer data bank) were taken except for the West less Rock Island (1973-74), which did not show a stable pattern over the 4-year period. The use of proportions as bases for projections seems suitable insofar as betterments are concerned, since betterment expenditures are concomitant with track replacement activity. As bases for projecting expenditures for new track construction, the proportions are not entirely satisfactory on conceptual grounds. Consequently, historical data from schedules 514 and 516 of the R-1 report will be added to the data bank to permit isolating new track construction costs and trends in new track construction for the different railroad groups, although even then only rail and tie expenditures can be identified. Another desired improvement is to project betterments so as to account for special circumstances expected in the future, such as expansion of track capacity to handle heavy coal movements.

Credits for track property retired are deducted each year from additions and betterments as part of the computation of investment in road property. These credits are found in schedule 211 of the R-1 Annual.

---

[34] Besides property accounts for track materials and labor (8, 9, 10, 11, and 12), additions and betterments projections include accounts 1, 2, 2 1/2, and 3 (representing right-of-way property such as land and grading) and much of which are nondepreciable. The full amounts for accounts 1 to 3 are included in the ratios to track materials.

TABLE 5-1

Ratios of track structure additions and betterments to track material and track labor operating expenses chargeable to freight service

	Track materials[a]	Track labor[b]
East less bankrupts and ConRail	.3278	.05174
South	.3861	.06368
West less R.I.	.3427	.04148

---

[a] Additions and betterments for property accounts 1 to 3 and 8 to 11 as a ratio to amounts allocated to freight service for operating expense accounts 212, 214, 216 and 218.

[b] Additions and betterments for property account 12 as a ratio to amounts allocated to freight service for operating expense account 220.

Report form. Since they have tended to be generally erratic and trendless, they are projected to remain constant at 1971-74 average levels. The amounts include owned and leased property but cover property accounts 8 through 12 only. Retirements for accounts 1 to 3 are covered largely in the development of depreciation base (see Forecast Methodology No. 8), since these accounts are partly depreciable.

Forecast Methodology No. 6

RETIREMENT SCHEDULE OF EXISTING DEBT

The methodology for scheduling repayments of principal on existing railroad debt is relatively straightforward. Existing debt (debt in the railroads' capital structures as of year end 1975) is comprised of funded debt (bonds), equipment debt (trust certificates and conditional sales agreements), other noncurrent liabilities (miscellaneous intermediate-term debt and payables to affiliates), and debt in default.

Principal repayments of the various forms of debt are scheduled in the following manner. Bonds for which there are no sinking fund requirements are shown as being retired in full at maturity unless assumed to be refinanced. Bonds for which there are sinking fund provisions are assumed to be cancelled serially at a rate consistent with past experience. Few bond indentures require mandatory sinking fund payments designed to cancel the issue in full by maturity. Rather, most sinking fund requirements represent token appropriations, usually contingent upon earnings. Therefore, a railroad will retire portions of its outstanding issues more on a discretionary basis, as when the market values of those issues are below their par values. This rate of cancellation is quantified and applied to the remainder of each railroad issue along with a "balloon" payment in the year of maturity, as necessary. The outstanding principal balances in the years of maturity of certain specific bonds are assumed to be refinanced.

Equipment debt is considered to mature in equal annual installments. Miscellaneous debts, one category of other noncurrent liabilities, are retired in installements, similar to equipment debt. Payables to affiliates, however, are usually on open account, meaning that there is no contractual agreement which binds the debtor road to a repayment schedule. Since there is an historical trend towards the increased use of affiliate debt, and because periodic repayment of this debt is difficult to forecast, it has been reflected as a net source of funds each year. Affiliate debt is discussed in greater detail in Forecast Methodology No. 10-*Schedule of New Debt.*

Debt in default is reflected only for the Texas Mexican Railway Co., although the road is not considered bankrupt. These obligations, totalling $2,340,000, are assumed to remain outstanding throughout the forecast period, requiring only payment of interest.

Nonequipment debt refinancing.—It is believed that a certain amount of long-term debt refinancing can reasonably be assumed. Although investors are somewhat wary of railroad bonds, because of the numerous defaults on such issues by the Northeast roads which entered bankruptcy in the recent past, the issuance by the Louisville & Nashville of $50 million in Baa-rated collateral trust bonds in July 1975 is evidence that the capital market is ready to accept some not particularly highly rated railroad securities. The amount of refinancings which can be expected, by district, have therefore been approximated based on an analysis of each railroad with issues maturing between 1976 and 1985.

Out of a total of approximately $722 million in bonds or other long-term, nonequipment debt maturing on the books of the solvent roads, it is believed that about $350 million (all A- or AA-rated issues) might be refinanced. This analysis is summarized in the table below:

TABLE NO. 6-1

District	Railroad	Amount Outstanding at 12/31/75, maturing between 1976-1985[1]	Amount assumed to be refinanced
		(C00's)	*(000's)*
East less	BO	$63,434	$27,000
Bankrupt	BAR	427	
Carriers and ConRail	CO	17,739	
Do	DH	6,913	
Do	DTS	2,231	2,231
Do	DTI	7,209	7,209
Do	MEC	11,999	
Do	NW	110,934	48,558
Do	WM	28,791	
Subtotal		249,677	84,998
South	ICG	39,559	39,559
Do	LN	55,587	
Do	SCL	49,137	20,980
Do	WRA	1,543	
Subtotal		145,826	60,539

TABLE NO. 6-1—Continued

District	Railroad	Amount outstanding at 12/31/75, maturing between 1976-1985[1]	Amount assumed to be refinanced
West less	BN	$78,732	$54,508
Rock Island	CNWT	9,404	
Do	FWD	8,717	
Do	KCS	34,772	34,772
Do	MKT	1,550	
Do	SLSF	14,312	
Do	SP	117,312	67,312
Do	TP	8,092	
Do	UP	32,201	32,201
Do	WP	21,011	15,175
Subtotal		326,103	203,968
Grand total		721,606	349,505

[1] Does not include issues pledged as collateral to secure other outstanding issues.

It appears significant that a majority of these debts were originally incurred for refinancing purposes. Out of a total of 52 separate issues reflected in the above data, 15 were issued to finance the acquisition of new lines and properties, other capital expenditures, betterments, working capital, and the redemption of preferred stock; three issues are for unknown purposes; and 34 issues represent refinancing of long-term debt. Most of this latter group of issues date back to the 40's and 50's, indicating that the capital markets were willing to accept maturities of 30 or 40 years, but that the era of 100-year issues was clearly over. To assume that many of these 54 issues will again be refinanced requires that such fundamental changes in investor preference be recognized. It is, therefore, assumed that the capital market of the coming decade will accept railroad issues with maturities not exceeding 25 years.

The issues actually chosen for the refinancing assumption meet certain criteria. They are currently A-rated, or better, by Moody's Investors Service, Inc. They have no sinking fund provision, or else the sinking fund agreement requires such nominal (or contingent) appropriations that the issue could still be largely outstanding by its maturity date. Also, weight was given to whether the railroad was capable of generating the amount of cash flow that would be necessary to retire the issue in 1, or several, years. It was decided that 21 of the 54 railroad debt issues maturing between 1976 and 1985 might be refinanced. It should be made clear, however, that the railroads listed in the table above are not necessarily expected to refinance the particular issues isolated by these criteria. Rather, the amount of refinancings which ultimately occur throughout the districts, regardless of the specific issues refinanced, have been approximated by this method.

The projected financial statements included in this report show the railroads' projected annual debt balances, principal repayments, and interest payments on a basis combining existing debt and new debt. Debt balances and principal repayments on existing debt, alone, are shown below. Included in those debt balances is the item "bond refinancing," which is a summation of the individual issues chosen in the above analysis. These are all assumed to require sinking fund appropriations (and cancellations) in 25 equal annual installments.

Schedule of existing long-term debt and bond refinancing class I line-haul railroads-eastern district, excluding bankrupt roads

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Yearend long-term debt balance:										
Funded debt	$704,040	$682,244	$611,173	$586,851	$535,775	$484,081	$455,075	$432,475	$414,698	$398,826
Bond refinancing	0	6,852	32,487	37,145	35,530	65,676	62,738	61,781	60,590	57,494
Equipment debt	850,337	727,106	609,906	505,236	411,017	325,956	256,547	200,674	152,134	112,543
Other noncurrent liabilities[1]	10,860	4,628	3,108	2,170	1,232	1,080	928	776	624	472
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	1,565,237	1,420,830	1,256,674	1,131,402	983,554	876,793	775,288	695,706	628,046	569,335
Principal repayments and sinking fund appropriations:										
Funded debt	23,707	14,659	44,071	18,049	51,076	18,610	29,006	20,537	15,872	15,872
Bond refinancing	0	285	1,365	1,615	1,615	2,938	2,938	3,020	3,096	3,096
Equipment debt	128,212	123,231	117,200	104,670	94,219	85,061	69,409	55,873	48,540	39,591
Other noncurrent liabilities[1]	7,551	6,232	1,520	938	938	152	152	152	152	152
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	159,470	144,407	164,156	125,272	147,848	106,761	101,505	79,582	67,660	58,711

Class I line-haul railroads-southern district

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Yearend long-term debt balance:										
Funded debt	770,788	746,652	730,956	718,560	680,360	630,134	620,234	606,357	596,642	529,170
Bond refinancing	0	0	0	0	553	39,244	37,609	35,974	34,339	40,676
Equipment debt	1,218,344	1,065,579	919,632	782,235	657,062	543,567	445,067	356,406	273,567	198,331
Other noncurrent liabilities[1]	3,252	899	201	176	151	126	97	92	87	82
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	1,992,384	1,813,130	1,650,789	1,500,971	1,338,126	1,213,071	1,103,007	998,829	904,635	768,259

See footnote at end of table.

Schedule of existing long-term debt and bond refinancing class I line-haul railroads-eastern district, excluding bankrupt roads—Continued

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Class I line-haul railroads-southern district—Continued										
Principal repayments and sinking fund appropriations:										
Funded debt	$14,153	$24,136	$15,696	$12,396	$37,624	$9,900	$9,900	$13,877	$9,715	$59,168
Bond refinancing	0	0	0	0	23	1,635	1,635	1,635	1,635	1,967
Equipment debt	156,492	152,765	145,947	137,397	125,173	113,495	98,500	88,661	82,839	75,236
Other noncurrent liabilities[1]	5,697	2,353	698	25	25	25	29	5	5	5
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	176,342	179,254	162,341	149,818	162,845	125,055	110,064	104,178	94,194	136,376
Class I line-haul railroads-western district, excluding Chicago, Rock Island & Pacific R. R. Co.										
Yearend long-term debt balance:										
Funded debt	2,070,866	2,004,309	1,944,896	1,912,965	1,864,195	1,796,078	1,760,315	1,705,431	1,658,234	1,614,383
Bond refinancing	0	44,438	77,379	85,863	82,072	78,281	87,469	121,538	143,869	163,611
Equipment debt	2,202,153	1,942,118	1,692,933	1,457,545	1,236,799	1,029,125	845,815	679,592	527,414	388,829
Other noncurrent liabilities[1]	81,625	58,098	44,822	38,353	32,610	27,359	22,769	21,023	19,378	17,797
Debt in default	2,340	2,340	2,340	2,340	2,340	2,340	2,340	2,340	2,340	2,340
Total	4,356,984	4,051,303	3,762,370	3,497,066	3,218,016	2,933,183	2,718,708	2,529,924	2,351,235	2,186,960
Principal repayments and sinking fund appropriations:										
Funded debt	17,253	20,268	23,172	19,656	48,770	68,117	22,244	14,884	17,758	15,883
Bond refinancing	0	1,851	3,300	3,791	3,791	3,791	4,331	5,931	7,108	8,226
Equipment debt	312,705	260,035	249,185	235,388	220,746	207,674	183,310	166,223	152,178	138,585
Other noncurrent liabilities[1]	37,664	23,527	13,276	6,469	5,743	5,251	4,590	1,746	1,645	1,581
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	367,622	305,681	288,933	265,304	279,050	284,833	214,475	188,784	178,689	164,275

---

[1] Miscellaneous obligations other than bonds.

Forecast methodology No. 7

EXISTING LEASES (ATTRITION PROJECTIONS)

Long-term lease payments for freight cars are defined in the 1975 R-1 Annual Reports of the railroads (schedule 376, line 15, columns d and f) although the terms of each railroad lease agreement are not readily available. It is known that, in general, equipment leases run about 15 years. The methodology for scheduling lease payments is to make the assumption that the railroads have entered into those agreements which give rise to the payments over each of the previous 15 years in roughly equal amounts each year. Total base year lease payments, by district, are then reduced by one-fifteenth in each of the following years of the forecast period to represent the termination of lease agreements entered into 15 years prior. The following table shows these forecasted payments for each railroad group:

TABLE 7-1

Scheduling of long-term freight car lease payments on existing lease agreements (thousands of dollars)

Year	East less bankrupt carriers and ConRail	South	West less Rock Island
1975	$82,031	$52,891	$110,052
1976	76,562	49,365	102,715
1977	71,094	45,839	95,378
1978	65,625	42,313	88,042
1979	60,156	38,787	80,705
1980	54,687	35,261	73,368
1981	49,219	31,735	66,031
1982	43,750	28,209	58,694
1983	38,281	24,682	51,358
1984	32,812	21,156	44,021
1985	27,344	17,630	36,684

The above forecasted payments are included in the Net Rents account in the Projected Income Statements in this report, both on a current dollar and inflated dollar basis.

Forecast methodology No. 8

DEPRECIATION CONCEPTS AND PROCEDURES

The following narrative describes the methodologies used to project depreciation base, depreciation reserve, depreciation expense, net investment base, and cash generated from disposition of retired assets. The results of these studies were used as input into a funds flow model which will endeavor to forecast the total financial picture of the railroad industry. The figures projected were segregated into these geographic areas:

District I -------------------------- (Eastern—less bankrupts and ConRail)
District II -------------------------- (Southern)
District III -------------------------- (Western—less Chicago, Rock Island and Pacific Railroad Co.)

The data used in these analyses relates to all class I line-haul railroads except the ones stated above. Amtrak, The Long Island Railroad, and Auto Train are not included because they are not considered freight haulers. Amtrak facilities have the potential of carrying freight and will be given consideration in future analyses. Track accounts, which are not ratably depreciable are not considered in this analysis.

Because our data base is only current through January 1, 1972,[35] all calculations were made as of that date. To overcome this delay in reporting of data, the age distribution, that is, the percent of property surviving from each year's installations, was considered the same at December 31, 1975, as it was at January 1, 1972 (constant property mix assumption). Also the total units of equipment for calculating purposes are considered to be constant throughout the projection period.

The constant renewals[36] model assumes that the retirements of property, whether measured in units or dollars, will be exactly matched by additions of new units or dollars in the same year.

The starting point of the projection process is development of a beginning age distribution at December 31, 1975. For equipment, an actuarial analysis is performed to generate age distributions as of January 1, 1972, and to furnish data for use in estimating the appropriate Iowa Type Survivor Curve. The age distributions are applied to the total units and dollars of investment to determine the distribution of units or dollars by year of installation at December 31, 1975.

For road property a simulation analysis is performed to estimate an appropriate Iowa Type Survivor Curve. The characteristics of these curves are applied to the total dollars as reported in the 1975 Annual Reports R-1 to give the starting age distribution in dollars.

Projection of retirements (renewals) for both equipment and road property during the period 1976 thru 1985 is accomplished by applying the appropriate Iowa Type Survivor Curve to the starting age distribution. Retirements are generated for each year of the projection period by retiring property as indicated by the characteristics of the Iowa Type Survivor Curve. Table 8-1 shows forecasted equipment retirements for total U.S. (less previously stated exceptions).

---

[35] The Commission is contemplating a requirement to have the depreciation data base made current on a continuing basis.

[36] Renewals are defined as replacements "in kind" which have exactly the same life characteristics as the property retired.

TABLE 8-1

Forecasted equipment retirements-original cost dollars
(000 dollars)

Years	Locomotives	Freight cars
1976	239,530	368,140
1977	229,363	342,848
1978	228,318	344,315
1979	225,286	351,399
1980	222,422	361,812
1981	217,922	374,270
1982	212,911	388,056
1983	207,950	402,596
1984	203,548	417,415
1985	200,141	432,053

To compensate for the assets included in passenger-train cars and floating equipment, a constant depreciation base was assumed for the 10-year period, 1976-1985. Since a renewals (retirement) program was not prepared for the relatively minor dollar amounts in TOFC/COFC equipment, work equipment, and miscellaneous equipment, the average of recent actual original cost retirements was considered to be an acceptable retirement projection for each year of the forecast period. The effect of this rationale is considered to be negligible and subsequent refinement and expansion of the Depreciation Data Base will incorporate information on these properties.

Because of the railroads' reliance upon the lease option for equipment, a certain percentage of the locomotive and freight-train car additions had to be deducted from the estimated total to give weight to the lease-buy percentage. This percentage was projected in the proportions shown in table 8-2. The deduction was deemed necessary as this phase of the funds flow model is concerned only with the forecast of capital expenditures. Operating expenses due to leasing of equipment are considered in other sections of the model.

TABLE 8-2

Forecasted lease-buy percentages

District	Locomotives	Freight cars
	Percent	*Percent*
Eastern, less bankrupts and ConRail	23-77	28-72
Southern	12-88	21-79
Western, less Rock Island	16-84	21-79

The calculation of retirements of road property is similar to the equipment calculation. The age distribution used to develop the projected retirements was calculated from the data base developed in this proceeding. Grading, tunnel bores and public improvements-construction are assumed to be depreciable for purposes of this forecast. Retirement projections for the total U.S. (less previously stated exceptions) are shown in table 8-3.

TABLE 8-3

Forecasted road property retirements—original cost dollars (000 dollars)

Years	$
1976	135,995
1977	134,128
1978	133,449
1979	133,136
1980	133,219
1981	133,596
1982	134,208
1983	134,983
1984	135,858
1985	136,815

Depreciation base.—The starting depreciation base, as of December 31, 1975, was obtained from the 1975 Railroad Annual Report R-1, Schedule 211.

Depreciation reserve.—The starting depreciation reserve, as of December 31, 1975, was obtained from the Railroad Annual Report R-1, Schedule 211D, Depreciation Reserve-Road and Equipment-Owned and Used. To project the depreciation reserve, the depreciation expense for a given year was added to the existing reserve and the service value (ledger value less salvage) deducted to produce a reserve balance for the ensuing year. Thus the forecasts for the 10-year period were in effect an accumulative adjustment built on forecasts of expenses, retirements and salvage values.

Depreciation expense.—Annual depreciation expense is determined through application of a depreciation rate to the depreciation base. The formula used to develop the depreciation rate is:

$$\frac{100 - \text{Salvage } (\%)}{\text{Average service life}} = \text{Depreciation rate}$$

Service lives were developed using the previously mentioned simulation and actuarial techniques. Because of a dearth of data in the minor equipment accounts it was necessary to group them with locomotive or freight cars based on similarity of estimated service lives.

For road property, the service life of each group classification in each district was dollar weighted to produce a composite service life for total investment in road property for each district. A road property group is a collection of primary accounts with similar service lives. An example of this determination is shown in table 8-4:

TABLE 8-4

Computation of composite depreciation rate

DISTRICT I (EASTERN—LESS BANKRUPTS AND CONRAIL)

Group No.	1975 base (000,000)	Service life (Years)	Salvage (percent)
1	$636	146	0
2	786	58	4
3	93	32	3
	448	31	4
	1,963	79	3

Salvage —In order to provide for disposition of retired assets, a judgment based on experience was made to utilize a 10-percent salvage factor for equipment and a 3-percent salvage factor for road property.

Using the salvage with the weighted average lives in the depreciation rate formula, composite depreciation rates were calculated. The rate applied to the year end depreciation base produced the depreciation expense for each year of the projection period.

Disposition of retired assets or salvage is considered for purposes of this study to be a debit (charge) to cash and a credit to the depreciation reserve. Since this is an actual source of cash to the carrier disposing of retired property, the projections for cash should incorporate these values. An example of these calculations for a typical year is shown in table 8-5:

TABLE 8-5

Depreciation base, expense, reserve and debit to cash (000 dollars)

Locomotives—Eastern (less bankrupts and ConRail)
Highway revenue equipment
Miscellaneous equipment

1975 Base		744,329
1976 Additions		+108,234
1976 Retirements		-46,217
1976 Base		806,346
Service life	20 years	
Salvage	10 percent	
Rate	4.50 percent	
1976 Depreciation expense (4.50 x 806,346)		36,286
1975 Depreciation reserve		438,425
1976 Depreciation expense		+36,286
1976 Retirements (service value—90% x 46,217)		-41,595
1976 Reserve		433,116
Cash debit (salvage = 10% x 46,217)		4,622

Net investment base.—The depreciation base as of a given year less the recorded depreciation reserve sustained on those assets is the net investment base. An example of the pertinent factors leading to the determination of the net investment base is included here for the total U.S. as table 8-6:

TABLE 8-6

Determination of net investment base
(000 dollars)

	Depreciation base	Depreciation reserve	Depreciation expense	Cash debit
District I:				
Eastern (less bankrupts and ConRail-	5,846,876	1,919,395	185,501	15,865
District II:				
Southern	6,130,216	1,561,246	195,077	11,760
District III:				
Western (less CRI&P)	14,798,163	4,524,403	428,645	37,221
Total	26,775,255	8,005,044	809,223	64,846
Net investment	18,770,211			

Forecast Methodology No. 9

RENT INCOME AND RENT PAYABLE EXCLUDING FREIGHT CAR LEASES

1. Overview

The items forecasted under the heading of car hire and other rents and their relationship to the Uniform System of Accounts are shown below:

	Receivable	Payable	ICC Account No.
Hire of freight cars and highway revenue equipment.			503 and 536
1. Railroad-owned per diem and and mileage cars.			Breakdown in schedule 376 of Form R-1.
(a) per diem	x	x	
(b) mileage	x	x	
2. Mileage cars		x	
3. Highway revenue equipment	x	x	
4. Ratio of projected amounts payable or receivable to total excluding long-term leases.	x	x	
5. Locomotive rents	x	x	504, 537
6. Work equipment rents	x	x	507, 540
7. Joint-facility rents	x	x	508, 541

Each of these categories of rents was dealt with separately. Only the projected payments for per diem and mileage on railroad-owned cars are derived directly from the figures underlying the equipment expenditure projections. Moreover, since data for years prior to 1971 were not available in the project's computer data bank for items in schedule 376, 1971-74 or fewer years had to be used for averages of several factors in the projections. The breakdown of projected rent income and rent payable excluding freight car leases is shown in table 9-8. Projected freight car lease rents are shown in Forecast Methodology Nos. 7 and 14.

Perhaps the most difficult problem one faces in projecting rents is that of appropriate price deflation. Equipment rents do change with inflation in equipment prices and maintenance expenses but the relationship is probably more with the inflationary experience of prior years than with current inflation. The assumption made in constructing a special deflator for equipment rents (freight cars, locomotives, highway revenue, and work equipment) was that equipment rents would change at the same rate as a 2-year lagged index combining railroad equipment prices and rail labor and material costs. This lagged index was constructed as a 3-year moving average of half the wage or price index for railroad equipment plus half the AAR index for wages and material prices combined. When this rent deflator is applied to historical data the results appear reasonable. But when applied to projected constant dollar figures to obtain inflated dollar projections, the rate of increase seems implausibly higher (see table 9-1 for historical and projected series of this deflator). Evidently, the sharp jump in equipment and materials prices from 1973 to 1974 is carried over into the forecast period in the rent deflator, and with the base index at a level corresponding to pre-1974 equipment and materials prices, the inflation rate seems exhorbitant for an index that would presumably be restrained, given the fact that to some degree the rental costs are of an embedded nature.

In the case of joint-facility rents, too little was known *a priori* to develop an index incorporating assumptions as for equipment rents. Instead the attempt was made to estimate empirically the relationship between the inflation rate for joint-facility rents and that for the AAR combined index of wages and materials prices.

Forecast bases (*e.g.*, rental rates, using some regression equations) are largely developed in terms of 1974 constant dollars. Appropriate price or rent indices are used for conversion to 1975 constant dollars or inflated dollars.

2. Hire of freight cars and highway revenue equipment (short term)

(a) ***Railroad owned per diem/mileage cars.***—The projection of cars on line to ownership ratios for the equipment expenditure projections afforded a propitious link to the car hire estimates. Having estimated shares of cars installed and retirements by group, one could readily work back to projected ownership and (through the cars on line to ownership ratios) to cars on line. The only additional information needed was the ratio of system cars on line to ownership. Time trends in this ratio were estimated by regression analysis (see table 9-4 for estimating equations adopted). Deducting system cars on line from total cars on line yields foreign cars on line—the basis for the projection of per diem and mileage payable.[37] Similarly, deducting system cars on line from ownership yields system cars off line—the basis of the projection of per diem and mileage receivable. Projected foreign cars off line and system cars on line are shown in table 9-2. Details of the sequence involved in the computation of per diem and milage receivable and payable are shown in table 9-3. Days and mileage payable per foreign car on line, per diem and mileage rates payable, days receivable per system car off line, per diem rate receivable, and dollar amount of mileage receivable per system car off line are all elements entering into the computations. These elements are obtained on the basis of averages from the 1971-74 period for which data was retrievable from the project's computer bank.[38] The per diem and mileage rates were adjusted proportionately to yield zero balance between receivables and payables for the industry as a whole in each of the forecast years. See table 9-5 for the per diem and mileage projections.

---

[37] System cars on line and ownership are measured as discussed with respect to total cars on line in Forecast Methodology No. 4A (equipment expenditure projections)—i.e., as average numbers of cars during the year (averaging four quarterly figures); Source: AAR form CS-8A.

(b) *Mileage cars.*—Practically all these cars are rented from private car lines, some of which are owned by groups of railroads; refrigerator and TOFC flatcars account for most of these. Car-miles payable (Form R-1, schedule 376) were projected on the basis of the ratio of the 1971-74 percentage change in car-miles payable to the 1971-74 percentage change in ton-miles. Formulas used for the projections are shown in table 9-4. Average 1974 dollar rates per car-mile for each group were constructed from the 1971-74 data. The projections themselves appear in table 9-6.

(c) *Highway revenue equipment.*—This category of rents, which includes auto-racks and TOFC trailers, appears to relate well to revenue ton-miles. Deflated rents payable per ton-mile do not vary much for each group. This factor and the ratio of receivable to payable rents for highway revenue equipment were obtained as averages from the 1971-74 data (see table 9-4 for years chosen for each group's averages).

(d) *Total car hire and Railbox adjustment.*—The foregoing items projected account for nearly all car hire payable or receivable excluding long-term leases. The ratio of the total to the sum of items projected was constructed from averages from the 1971-74 data (see table 9-4) and applied to obtain total car hire payable and receivable. Railbox rentals were added to the total payable on the basis of the same factors for each group as shown in the per diem computations, except that the cars on line figure used in the projection are obtained as the 1971-74 average share of plain boxcars on line to the national level of plain boxcars on line.

3. Other rents

(a) *Locomotive rents.*—The attempt initially was to conduct regression analyses (in logarithms) of locomotive rents payable against ton-miles, time and the AAR index of wages and material prices. In most cases the high correlation between the independent variables led to unreliable estimates of the inflation factor (derivable from the coefficient of the AAR index). For the South the regession results were found acceptable, but for the other groups, the rents, deflated by the special equipment rents deflator, were related by regression analysis to ton-miles (and time), using a logarithmic formulation. Logarithmic formulations were used for regression estimates of time trends in receivable to payable ratios. See table 9-4 for the bases used for projections. Sharp upward trends mark some of the projections for rents payable, a result which may be incompatible with the locomotive needs estimated for the equipment expenditure projections; a closer examination of this result is warranted.

(b) *Work equipment rents.*—These series, when deflated, do not appear to relate to any basic variables forecasted, but rather are relatively small amounts that seem erratic or devoid of any trends. Averages around appropirate year ranges were computed for each group for constant annual amounts in 1974 constant dollars.

---

[38] Actually, data prior to 1971 would not have been very helpful since the changeover to a mileage/per diem system of payments renders the prior data almost incomparable.

(c) *Joint-facility rents.*—These rents are expected to vary to some extent with traffic (represented by revenue ton-miles) where rental agreements provide for compensation based on use as well as on rates of inflation, and perhaps with future changes in corporate or industry structure decreasing or increasing trackage covered by such agreements. Regression analysis was applied to these data in logarithmic form and found satisfactory in estimating the inflation factor for some groups. Generally, the results followed a pattern suggesting that the applicable inflation rate is 0.2 or 0.4 percent of the AAR wage and price index inflation, depending on the group. These factors were used to deflate the rents payable for some groups to obtain improved estimates of relationship to traffic. Final estimating equations are shown in table 9-4. The proportion receivable was projected on the basis of logarithmic time trend regression analysis.

4. Possible Improvements

(a) *Equipment rent deflator.*—More research is needed to refine the deflator so that rates of increase will reflect the constraints of embedded costs.

(b) *Car hire.*—Historical data going further back may reveal time trends overlooked in using fixed figures for some computational factors.

(c) *Railbox rentals.*—The structure and level of charges need to be clarified. Existing per diem/mileage was used here on the assumption that cognizance would be taken of possible distortions in deviating very significantly from the per diem/mileage levels.

(d) *Locomotive rentals.*—Long-term lease rentals need to be broken out of schedule 377 and historical data for several years entered in the project's computer bank to insure compatibility of rent projections with the equipment expenditure projections and to improve the reliability of estimated long-term trends for the series.

TABLE NO. 9-1

Equipment rent deflator, 1965-75 (historical), 1976-85 (projected) (1974 = 100)

1965	65.8
1966	66.8
1967	68.2
1968	70.3
1969	72.8
1970	76.3
1971	80.9
1972	86.4
1973	92.8
1974	100.0
1975	111.6
1976	126.4
1977	145.3
1978	161.9
1979	178.5
1980	191.7
1981	204.2
1982	215.2
1983	227.3
1984	240.7
1985	255.1

TABLE NO. 9-2

Projected average number of foreign cars on line and system cars off line (thousands)

		East Less Bankrupts	South	West Less R.I.	Bankrupts East	Rock Island
1976	Col	296.5	270.1	539.9	241.0	26.1
	Own	279.3	279.7	577.8	212.0	25.0
	Prop. Sys. o/l	.54	.588	.54	.604	.481
	For. on line	145.7	105.7	227.9	113.1	14.1
	Sys. off line	128.5	115.3	265.8	84.1	13.0
1977	Col	295.2	271.6	542.6	234.8	25.7
	Own	274.0	282.1	582.3	207.1	24.4
	Prop. Sys. o/l	.54	.591	.54	.610	.481
	For. on line	147.2	104.9	228.2	108.5	14.0
	Sys. off line	126.0	115.4	267.9	80.8	12.7
1978	Col	290.1	269.1	532.8	229.0	25.0
	Own	265.6	280.5	573.7	202.7	23.6
	Prop. Sys. o/l	.54	.594	.54	.616	.481
	For. on line	146.7	102.4	223.0	104.1	13.7
	Sys. off line	122.2	113.8	263.9	77.8	12.3
1979	Col	289.2	271.8	533.2	223.4	24.6
	Own	261.0	284.1	575.8	198.3	23.0
	Prop. Sys. o/l	.54	.598	.54	.623	.481
	For. on line	148.3	102.0	222.3	99.9	13.5
	Sys. off line	120.1	114.3	264.9	74.8	11.9

Projected average number of foreign cars on line and system cars off line (thousands)—Continued

		East Less Bankrupts	South	West Less R.I.	Bankrupts East	Rock Island
1980	Col	296.3	283.5	552.3	221.3	24.7
	Own	263.5	297.0	597.8	196.9	22.9
	Prop. Sys. o/l	.54	.601	.54	.629	.481
	For. on line	154.0	105.0	229.5	97.5	13.7
	Sys. off line	121.2	118.5	275.0	73.1	11.9
1981	Col	303.0	295.7	573.6	219.5	24.9
	Own	265.6	310.3	622.2	195.7	22.8
	Prop. Sys. o/l	.54	.604	.54	.635	.481
	For. on line	159.6	108.2	237.6	95.2	13.9
	Sys. off line	122.2	122.8	286.2	71.4	11.8
1982	Col	305.8	303.9	589.3	217.9	25.0
	Own	264.2	319.7	640.6	194.7	22.8
	Prop. Sys. o/l	.54	.608	.54	.642	.481
	For. on line	163.1	109.7	243.4	93.0	14.0
	Sys. off line	121.5	125.5	294.7	69.8	11.8
1983	Col	306.4	310.6	605.3	212.9	25.2
	Own	261.0	327.2	659.0	190.5	22.7
	Prop. Sys. o/l	.54	.611	.54	.648	.481
	For. on line	165.5	110.8	249.4	89.5	14.3
	Sys. off line	120.1	127.4	303.1	67.1	11.8

Projected average number of foreign cars on line and system cars off line (thousands)—Continued

		East Less Bankrupts	South	West Less R.I.	Bankrupts East	Rock Island
1984	Col	301.8	311.0	607.0	206.8	27.1
	Own	253.6	328.3	662.2	185.5	24.2
	Prop. Sys. o/l	.54	.614	.54	.654	.481
	For. on line	164.9	109.4	249.4	85.4	15.5
	Sys. off line	116.7	126.7	304.6	64.1	12.6
1985	Col	302.4	320.0	628.2	204.3	23.3
	Own	250.4	338.1	685.8	183.3	20.6
	Prop. Sys. o/l	.54	.617	.54	.661	.481
	For. on line	167.2	111.3	257.9	83.2	13.4
	Sys. off line	115.2	129.4	315.5	62.2	10.7

Note

Foreign cars and system cars are defined for individual railroads within each group. Foreign cars on line are railroad owned cars not belonging to railroad on whose line they are located. System cars on line are cars of a particular railroad's ownership on the lines of another railroad. Group figures are totals of individual road figures for each of these items.

Key to abbreviations:

Col. - Railroad-owned cars on line
Own. - Ownership for particular group
Prop. sys. o/l. - System cars on line as a proportion of ownership.
For. on line - Foreign cars on line.
Sys. off line - System cars off line.

TABLE NO. 9-3

Car hire projection factors, railroad-owned per diem/mileage cars[a]

	East less bankrupts and ConRail	South	West less R.I.	Bankrupt east	Rock Island
1. Per diem rate receivable ($)	4.347	[b] 4.545	[c] 5.227	[d] 5.504	3.743
2. Days receivable per system car off line	348.7	338.8	296.1	[d] 194.6	367.5
3. Adjusted per diem rate receivable ($)[g]	4.218	4.411	5.072	5.341	3.632
4. Per diem rate payable ($)	[d] 4.866	[c] 4.668	5.135	[c] 6.014	[c] 4.673
5. Days payable per foreign car on line	[e] 246.8	312.3	[e] 243.8	[d] 299.8	445.7
6. Adjusted per diem rate payable[g]	5.019	4.815	5.296	6.203	4.820
7. Mileage charges receivable per system car off line	[e] 439.5	[e] 542.6	540.5	[c] 287.9	397.6
8. Mileage rate payable ($)[f]	[e] .03069	.02813	.02852	.03034	[e] .02806
9. Car miles payable per foreign car on line	11,500	21,216	[e] 20,400	15,849	25,111
10. Adjusted mileage charges receivable per system car off line[h]	451.8	557.8	555.6	295.9	408.7
11. Adjusted mileage rate payable[h]	.02988	.02739	.02777	.02954	.02732

[a] All factors computed as 1971-74 averages unless otherwise noted. (Dollar amounts are in 1974 constant dollars.) Sources: AAR form C8-8A and Annual Report Form R-1, Schedule 376.

[b] 1972-73 average.

[c] 1974 value.

[d] 1973-74 average.

[e] 1972-74 average.

[f] Mileage charges divided by car miles payable.

[g] Computed as follows:

S_R = Sum of 1979 system cars off line x days receivable per system car off line x per diem rate receivable for each group.

S_F = Sum of 1979 foreign cars on line x days payable per foreign car on line x per diem rate payable for each group.

$$\text{Adjusted per diem rate receivable} = \left[\frac{(S_R + S_P) \div 2}{S_R}\right] \times \text{per diem rate receivable}$$

$$\text{Adjusted per diem rate payable} = \left[\frac{(S_R + S_P) \div 2}{S_P}\right] \times \text{per diem rate payable}$$

[h] Shown for illustrative purposes. Similar computations are made for each forecast year Computed as follows:

S_R = Sum of 1979 system cars off line x mileage charges receivable per system car off line for each group.

S_P = Sum of 1979 foreign cars on line x mileage rate payable x car miles payable per foreign car on line for each group.

$$\text{Adjusted mileage charges receivable per system car off line} = \left[\frac{(S_R + S_P) \div 2}{S_R}\right] \times \text{mileage charges receivable per system car off line}$$

$$\text{Adjusted mileage rate payable} = \left[\frac{(S_R + S_P) \div 2}{S_P}\right] \times \text{mileage rate payable}$$

TABLE NO. 9-4

Regression results and other projection bases

1. SYSTEM CARS ON LINE TO OWNERSHIP RATIOS

East less Bankrupts and ConRail	1964-74 av.	
South	$.545+.00329_t$	$R^2 = .19$
West less Rock Island	1964-74 av.	
Bankrupt East	$.521+.00635_t$	$R^2 = .24$
Rock Island	1973 value	
	t=1-1964	

2. CAR MILES PAYABLE, MILEAGE CARS PROJECTION FORMULAS

East less Bankrupts and ConRail

$$\left[\left(\frac{Tms_t}{Tms_{74}}, -1\right).95+1\right] Cms_{74}$$

r=.06464
1972-74 av.

South

$$\left[\left(\frac{Tms_t}{Tms_{74}} -1\right)1.126+1\right] Cms_{74}$$

r=.06806
1971-74 av.

West less R.I.

$$\left[\left(\frac{Tms_t}{Tms_{74}} -1\right).64+1\right] Cms_{74}$$

r=.06221
1971-74 av.

Tms_t - Ton-miles, year t= 1,1975.
Tms_{74} - Ton-miles for 1974.
Cms_t - Car-miles payable, year t= 1,1975.
Cms_{74} - Car-miles payable for 1975.
r=mileage rate in 1974 dollars.

3. HIGHWAY REVENUE EQUIPMENT RENT FACTORS AND RATIOS TOTAL TO PROJECTED CAR HIRE

	hwy/tm	hwy_r/hwy_p	$\left(\frac{tot}{proj}\right)_r$	$\left(\frac{tot}{proj}\right)_p$
East less Bankrupts and ConRail	370.5 (1971-74 av.)	.6274 (1973-74 av.)	1.005 (1974 value)	1.046 (1973-74 av.)
South	322.0 (1971-74 av.)	.5438 (1974 av.)	1.004 (1973-74 av.)	1.042 (1973-74 av.)
West less R. I.	287.8 (1971-74 av.)	.54445 (1971-74 av.)	1.049 (1971-74 av.)	1.076 (1971-74 av.)

$Hwy/_{tm}$ - Thousand 1974 dollar highway revenue equipment rent per billion ton-miles.
hwy_r/hwy_p - Ratio of highway revenue equipment rent receivable to payable.
$(tot/proj)_r$ = ratio of total to projected short term car hire rents receivable.
$(tot/proj)_p$ = ratio of total to projected short term car hire rents payable.

East Less Bankrupts and ConRail

Locomotive rents payable found to have a flat trend; deflated 1965-74 average of 25,403,320 selected.

$$\text{Ln}\left(\frac{\text{locomotive rents receivable}}{\text{locomotive rents payable}}\right) = -1.9203 + .10081\ (\text{time}^*)$$

$$r^2 = .767$$

South

$$\text{Ln(locomotive rents payable)} = -18.97 + \underset{(.273)^{**}}{.721}\ [\ln(\text{AAR index})] + \underset{(.4695)}{1.9181}\ [\ln(\text{ton-miles})]$$

$$r^2 = .968$$

$$\text{Ln}\left(\frac{\text{locomotive rents receivable}}{\text{locomotive rents payable}}\right) = .17336 - .053302\ (\text{time}^*)$$

$$r^2 = .854$$

West Less R. I.

$$\text{Ln}(\underline{\text{deflated locomotive rents payable}}) = -65.94 + 4.214\ [\ln(\text{ton-miles})]$$

1965-74 observation period.

$$r^2 = .879$$

$$\text{Ln}\left(\frac{\text{locomotive rents receivable}}{\text{locomotive rents payable}}\right) = .64724 - .11403\ (\text{time}^*)$$

$$r^2 = .838$$

*time = 1 corresponds to 1962.

**Numbers in parentheses are standard errors of corresponding regression coefficients.

5. WORK EQUIPMENT RENTS

East Less Bankrupts and ConRail

Work equipment rents receivable deflated found to have a flat trend, 1972-74 average of 1,751,000 selected.

Work equipment rents payable found to have a flat trend; 1962-74 average of 1,246,484 selected.

South

Work equipment rents receivable deflated found to have a flat trend; 1971-74 average of 401,800 selected.

Work equipment rents payable found to have a flat trend, 1962-74 average of 526,684 selected.

West Less R. I.

Work equipment rents receivable deflated found to have a flat trend; 1962-74 average of 1,077,616 selected.

Work equipment rents payable found to have a flat trend; 1969-74 average of 506,600 selected.

6. JOINT FACILITY RENTS

East Less Bankrupts and ConRail

The deflation index for joint facility rents payable = 1+[.2(AAR index -1)]. The deflated series proved to have a flat trend; 1962-74 average of 18,078,710 was selected.

$$\mathrm{Ln}\left(\frac{\text{jt. facility rents receivable}}{\text{jt. facility rents payable}}\right) = -.94602 + .038154\ (\text{time*})$$

$$r^2 = .702$$

South

Ln (jt. facility rents payable) = 6.7654 +
.2093 [ln (AAR index)] + .5274 [ln (ton-miles)]
(.2345)** (.3678)
-.02221 (time*)
(.02804)

$r^2 = .773$

Ratio of joint facility rents receivable to payable was found to have a flat trend; 1962-74 average of .57408 was selected.

West Less R. I.

The deflation index for joint facility rents payble = 1+ [.4 (AAR index -1)]

Ln (deflated joint facility rents payable) =
-3.2061 + 1.081 [ln (ton-miles)] -.05917 (time*)
(.570) (.02251)

$r^2 = .476$

Ratio of joint facility rents receivable to payable was found to have a flat trend; 1962-74 average of .58173 was selected.

*Time = 1 corresponds to 1962.

**Numbers in parentheses when present represent the standard error of the coefficient above each.

TABLE NO. 9-5

PER DIEM/MILEAGE CHARGES

	East less bankrupts and ConRail	South	West less Rock Island	Bankrupt East	Rock Island
A. Per diem receivable (thousands of 1975 dollars)					
1976	$215,015	$166,083	$454,178	$99,389	$19,705
1977	210,537	165,858	456,852	95,357	19,195
1978	203,846	163,401	449,582	91,705	18,544
1979	199,979	163,879	450,470	88,082	18,042
1980	201,400	169,504	466,536	85,778	17,920
1981	202,548	175,240	484,486	83,608	17,802
1982	201,080	178,691	497,821	81,570	17,766
1983	198,222	180,964	511,032	78,229	17,651
1984	192,380	179,831	512,924	74,716	18,795
1985	189,422	183,107	529,718	72,270	15,954
B. Per diem payable (thousands of 1975 dollars)					
1976	197,016	173,528	321,281	229,533	33,011
1977	199,513	172,483	322,284	220,705	32,814
1978	198,985	168,610	315,375	211,998	32,110
1979	201,482	168,283	314,881	203,902	31,904
1980	209,827	173,694	325,933	199,349	32,334
1981	217,918	179,383	338,260	195,125	32,998
1982	223,237	182,195	347,186	191,008	33,303
1983	226,928	184,377	356,630	184,196	33,968
1984	226,371	182,347	357,020	176,094	36,816
1985	230,247	186,010	370,215	172,015	31,984
C. Mileage charges receivable (thousands of 1975 dollars)					
1976	65,042	72,064	165,477	27,872	5,942
1977	63,700	71,981	166,484	26,747	5,790
1978	61,649	70,884	163,764	25,711	5,591
1979	60,477	71,089	164,082	24,695	5,440
1980	60,933	73,559	170,005	24,059	5,405
1981	61,311	76,087	176,636	23,462	5,372
1982	60,887	77,612	181,559	22,898	5,363
1983	60,069	78,661	186,522	21,977	5,333
1984	58,321	78,197	187,282	20,998	5,680
1985	57,471	79,687	193,575	20,328	4,826

	East less bankrupts and ConRail	South	West less Rock Island	Bankrupt East	Rock Island
D. Mileage charges payable (thousands of 1975 dollars)					
1976	$55,549	$68,155	$143,248	$58,731	$10,715
1977	56,234	67,722	143,646	56,453	10,647
1978	56,103	66,221	140,611	54,243	10,422
1979	56,801	66,087	140,376	52,166	10,354
1980	59,118	68,170	145,215	50,970	10,488
1981	61,356	70,355	150,606	49,856	10,695
1982	62,822	71,423	154,504	48,780	10,789
1983	63,801	72,211	158,558	46,997	10,994
1984	63,616	71,383	158,659	44,909	11,910
1985	64,637	72,741	164,349	43,823	10,336

TABLE NO. 9-6

MILEAGE CAR RENTALS

A. Mileage charges payable, thousands 1975 dollars

Year	East less Bankrupts	South	West less R.I.
1976	46,783	91,935	241,479
1977	50,316	100,163	255,863
1978	51,886	102,793	263,131
1979	53,563	106,300	269,941
1980	56,988	113,448	282,871
1981	59,771	119,518	293,620
1982	61,413	124,441	304,179
1983	62,804	128,757	315,349
1984	60,200	124,508	210,911
1985	61,234	129,904	321,699
B. Car miles payable (millions)			
1976	649.1	1,212	3,481
1977	698.1	1,320	3,689
1978	719.9	1,355	3,793
1979	743.2	1,401	3,892
1980	790.7	1,495	4,078
1981	829.3	1,575	4,233
1982	852.1	1,640	4,385
1983	871.4	1,697	4,546
1984	835.3	1,641	4,482
1985	849.6	1,712	4,638

TABLE NO. 9-7

HIGHWAY REVENUE EQUIPMENT RENTS

A. Rents receivable (Thousands of 1975 dollars)

	East less bankrupts and ConRail	South	West less Rock Island
1976	32398.0	29735.1	72558.0
1977	34963.9	32117.1	79127.2
1978	36104.3	32878.5	82446.8
1979	37322.4	33893.8	85556.6
1980	39810.6	35963.3	91461.9
1981	41832.2	37720.5	96371.3
1982	43024.5	39145.7	101193.4
1983	44035.3	40395.3	106295.0
1984	42143.3	39165.2	104268.3
1985	42894.9	40727.2	109195.2
B. Rents payable (thousands of 1975 dollars)			
1976	51638.4	54680.3	133268.5
1977	55728.2	59060.4	145334.3
1978	57545.9	60460.7	151431.3
1979	59487.5	62327.6	157143.3
1980	63453.3	66133.3	167989.6
1981	66675.5	69364.6	177006.8
1982	68575.8	71985.5	185863.5
1983	70187.0	74283.3	195233.7
1984	67171.3	72021.4	191511.3
1985	68369.3	74893.7	200560.6

TABLE NO. 9-8

BREAKDOWN OF PROJECTIONS OF RENT INCOME AND RENT PAYABLE, EXCLUDING FREIGHT CAR LEASES

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Eastern District, excluding bankrupt lines (inflated dollars, thousands)										
Rent income:										
Car rents	$352,213	$400,731	$435,715	$474,229	$516,601	$556,944	$585,556	$613,170	$628,874	$659,480
Joint facility rents	13,045	13,793	14,810	15,621	16,492	17,426	18,438	19,558	20,714	21,990
Locomotive rents	23,575	29,978	36,971	45,086	53,528	63,099	73,551	85,927	100,644	117,932
Work equipment rents	2,211	2,542	2,834	3,125	3,354	3,575	3,768	3,980	4,214	4,465
Rents payable:										
Car rents	419,799	497,427	558,653	627,387	706,370	784,336	847,600	911,895	951,189	1,025,280
Joint facility rents	18,957	19,293	19,940	20,244	20,573	20,924	21,311	21,759	22,182	22,667
Locomotive rents	32,084	36,885	41,127	45,344	48,672	51,873	54,667	57,741	61,145	64,778
Work equipment rents	1,574	1,809	2,018	2,224	2,388	2,545	2,682	2,833	3,000	3,178
Rail box rents	3,552	5,260	7,177	9,368	13,265	17,564	22,135	27,229	32,887	39,229
Southern District (inflated dollars, thousands)										
Rent income:										
Car rents	335,539	388,399	428,265	474,924	528,963	583,756	628,606	674,131	707,273	765,235
Joint facility rents	7,723	7,986	8,119	8,160	8,330	8,453	8,534	8,599	8,373	8,467
Locomotive rents	17,899	20,724	22,501	23,512	25,992	28,113	29,845	31,459	29,275	31,259
Work equipment rents	507	583	650	717	769	820	864	913	967	1,024
Rents payable:										
Car rents	461,819	546,042	606,577	676,913	760,027	842,902	911,341	983,172	1,019,881	1,112,673
Joint facility rents	13,453	13,911	14,142	14,215	14,511	14,725	14,866	14,980	14,585	14,748
Locomotive rents	33,479	40,885	46,822	51,604	60,171	68,644	76,861	85,455	83,874	94,464
Work equipment rents	665	764	852	940	1,009	1,075	1,133	1,197	1,267	1,343
Rail box rents	5,725	8,480	11,569	15,101	21,380	28,309	35,672	43,880	53,000	63,213

BREAKDOWN OF PROJECTIONS OF RENT INCOME AND RENT PAYABLE, EXCLUDING FREIGHT CAR LEASES—Continued

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Western District, excluding Rock Island (inflated dollars, thousands)										
Rent income:										
Car rents	$814,856	$950,712	$1,049,696	$1,164,287	$1,299,752	$1,441,038	$1,564,774	$1,702,268	$1,803,774	$1,978,022
Joint facility rents	22,060	23,609	24,731	24,938	26,006	26,726	27,420	28,252	26,948	27,684
Locomotive rents	20,895	30,882	36,532	42,006	53,296	63,171	72,969	84,603	73,707	84,635
Work equipment rents	1,361	1,564	1,744	1,923	2,064	2,200	2,319	2,449	2,593	2,747
Rents payable:										
Car rents	1,029,723	1,222,931	1,368,437	1,528,928	1,715,337	1,902,260	2,071,901	2,263,739	2,379,174	2,617,249
Joint facility rents	37,921	40,584	42,514	42,870	44,705	45,943	47,136	48,566	46,324	47,589
Locomotive rents	60,506	100,226	132,883	171,248	243,518	323,505	418,816	544,245	531,423	683,912
Work equipment rents	639	735	820	904	970	1,034	1,090	1,151	1,219	1,291
Rail box rents	16,497	24,432	33,333	43,506	61,594	81,557	102,770	126,407	152,677	182,091
Eastern District, excluding bankrupt lines (constant 1975 dollars, thousands)										
Rent income:										
Car rents	310,762	307,549	299,991	296,187	300,525	304,051	303,360	300,722	291,285	288,250
Joint facility rents	12,737	13,232	13,747	14,282	14,837	15,414	16,014	16,636	17,283	17,956
Locomotive rents	20,813	23,020	25,462	28,163	31,150	34,454	38,108	42,150	46,621	51,566
Work equipment rents	1,952	1,952	1,952	1,952	1,952	1,952	1,952	1,952	1,952	1,952
Rents payable:										
Car rents	370,394	381,760	384,634	391,844	410,920	428,190	439,117	447,228	440,576	448,136
Joint facility rents	18,508	18,508	18,508	18,508	18,508	18,508	18,508	18,508	18,508	18,508
Locomotive rents	28,324	28,324	28,324	28,324	28,324	28,324	28,324	28,324	28,324	28,324
Work equipment rents	1,389	1,389	1,389	1,389	1,389	1,389	1,389	1,389	1,389	1,389
Rail box rents	3,134	4,037	4,941	5,851	7,716	9,589	11,467	13,354	15,233	17,146

BREAKDOWN OF PROJECTIONS OF RENT INCOME AND RENT PAYABLE, EXCLUDING FREIGHT CAR LEASES—Continued

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Southern District (constant 1975 dollars, thousands)										
Rent income:										
Car rents	$296,050	$298,084	$294,861	$296,621	$307,716	$318,688	$325,663	$330,620	$327,598	$334,474
Joint facility rents	7,555	7,695	7,620	7,573	7,642	7,664	7,644	7,601	7,314	7,302
Locomotive rents	16,593	18,237	18,086	18,177	19,308	20,060	20,421	20,564	18,374	18,777
Work equipment rents	447	447	447	447	447	447	447	447	447	447
Rents payable:										
Car rents	407,469	419,070	417,629	422,776	442,134	460,163	472,140	482,185	472,393	486,334
Joint facility rents	13,160	13,405	13,273	13,192	13,311	13,351	13,315	13,241	12,740	12,720
Locomotive rents	31,036	35,980	37,634	39,895	44,698	48,981	52,592	55,859	52,643	56,743
Work equipment rents	586	586	586	586	586	586	586	586	586	586
Rail box rents	5,052	6,508	7,965	9,431	12,437	15,455	18,481	21,520	24,548	27,629
Western District, excluding Rock Island (constant 1975 dollars, thousands)										
Rent income:										
Car rents	718,957	729,641	722,717	727,173	756,110	786,701	810,664	834,857	835,480	864,566
Joint facility rents	21,062	21,802	21,483	21,076	21,351	21,294	21,159	21,032	19,416	19,237
Locomotive rents	18,447	23,714	25,159	26,239	31,015	34,493	37,807	41,501	34,143	37,007
Work equipment rents	1,200	1,200	1,200	12,00	1,200	1,200	1,200	1,200	1,200	1,200
Rents payable:										
Car rents	908,537	938,561	942,170	954,914	997,870	1,038,494	1,073,392	1,110,224	1,101,996	1,143,963
Joint facility rents	36,207	37,478	36,930	36,230	36,703	36,606	36,373	36,155	33,376	33,068
Locomotive rents	53,416	76,964	91,516	106,970	141,713	176,645	216,998	266,974	246,172	299,044
Work equipment rents	564	564	564	564	564	564	564	564	564	564
Rail box rents	14,556	18,750	22,950	27,172	35,831	44,524	53,242	61,995	70,717	79,589

Forecast Methodology No. 10

SCHEDULE OF NEW DEBT

The volume of new long-term debt that the railroads will incur in the forecast years is essentially a function of new equipment acquisitions which are expected to be financed with debt rather than leased.[39] In order to schedule out principal repayments on new equipment debt obligations, we have assumed that all new equipment financings will require a 20-percent downpayment and will mature in 15 equal annual installments, which are the prevailing terms for most equipment trust certificates. Equipment trust certificates are the only securities issued by the model for the financing of new equipment purchases. If the prevailing terms for equipment trust certificates change, then the model will be altered to reflect this fact.

Capital expenditures for such equipment items as freight cars, locomotives, cabooses, et cetera, have been projected in Forecast Methodology No. 4A—*Equipment Expenditure Projection*. To these projections (on both constant- and inflated-dollar bases) were applied certain ratios representing the estimated proportions of each type of new equipment acquisition that will be either financed or leased. These ratios are shown below:[40]

TABLE 10-1

Forecasted lease-buy ratio (Constant over years 1976-85)

	Freight cars*	Locomotives
	Percent	
East, less Bankrupts and ConRail	23	28
South	12	21
West, less Rock Island	16	21

*Ratios apply to the total of freight car and caboose expenditure projections.

The above ratios are based on historical averages for the period 1966-75. For example, out of the total freight car acquisitions in the southern district during this period, it was found that 88 percent were financed through equipment obligations reflected as debts on the railroads' balance sheets while 12 percent were represented by off-balance-sheet lease agreements requiring only periodic charges to income. There is no indication that these historical patterns will be substantially altered in the foreseeable future.

The only remaining category of debt projected for the solvent railroads is payables to affiliates. The trend towards the use of "affiliate debt" has increased during the last decade, as shown below:

---

[39] Bond refinancings—another form of new debt—are discussed in Forecast Methodology No. 6—*Retirement Schedule of Existing Debt*.

[40] These ratios are explained in more detail in Forecast Methodology No. 14—*New Equipment Leases*.

TABLE 10-2

Affiliate debt

(THOUSANDS OF DOLLARS)

Year	East less bankrupts and ConRail	South	West less Rock Island
1975	$626,233	$74,615	$203,712
1974	573,282	57,652	226,476
1973	545,078	61,569	202,293
1972	523,917	59,365	193,650
1971	512,941	59,785	190,347
1970	540,151	51,497	192,251
1969	551,021	49,823	134,939
1968	468,392	46,244	112,262
1967	435,937	42,655	108,227
1966	400,749	39,266	90,058

Source: R-1 Annual Reports to the Commission.

It is assumed that these debt balances will continue to increase in the future at the same rate as in the past. Fitting a trend line to the historical values above yields the following forecasts:

TABLE 10-3

Forecasted affiliate debt

(THOUSANDS OF DOLLARS)

Year	East less bankrupts and ConRail	South	West less Rock Island
1976	$626,626	$72,136	$247,922
1977	646,418	75,388	262,922
1978	666,210	78,641	277,922
1979	686,002	81,893	292,922
1980	705,794	85,146	307,922
1981	725,586	88,398	322,922
1982	745,378	91,651	337,922
1983	765,170	94,903	352,922
1984	784,962	98,156	367,922
1985	804,754	101,408	382,922

Since there is an upward trend to affiliate debt, and periodic repayment of this type of debt is difficult to forecast, it is reflected in the projected financial statements as a net source of funds in each year.

Debt balances and principal repayments on new debt are shown below. When these schedules are combined with similar schedules for existing debt shown in Forecast Methodology No. 6.—*Retirement Schedule of Existing Debt*, they form the combined debt balances reflected in the projected balance sheets and the combined principal repayments reflected in the projected funds flow statements.

Schedule of projected long-term debt constant dollar basis

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICT, EXCLUDING BANKRUPT ROADS

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Yearend long-term debit balance:										
Funded debt	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	260,499	495,890	628,855	799,717	1,050,354	1,251,974	1,377,336	1,447,729	1,423,073	1,464,968
Other noncurrent liabilities[1]	626,626	646,418	666,210	686,002	705,794	725,586	745,378	765,170	784,962	804,754
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	887,125	1,142,308	1,295,065	1,485,719	1,765,148	1,977,560	2,122,714	2,212,899	2,208,035	2,269,722
Principal repayments and sinking fund appropriations:										
Funded debt	0	0	0	0	0	0	0	0	0	0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	18,605	36,745	48,865	64,557	87,068	107,685	124,328	138,235	146,345	159,789
Other noncurrent liabilities	0	0	0	0	0	0	0	0	0	0
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	18,605	36,745	48,865	64,557	87,068	107,685	124,328	138,235	146,345	159,789

Class I line-haul railroads-southern district

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Yearend long-term debit balance:										
Funded debt	0	0	0	0	0	0	0	0	0	0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	428,721	814,378	1,032,362	1,339,886	1,794,560	2,183,580	2,464,113	2,662,253	2,676,954	2,873,087
Other noncurrent liabilities[1]	72,136	75,388	78,641	81,893	85,146	88,398	91,651	94,903	98,156	101,408
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	500,857	889,766	1,111,003	1,421,779	1,879,706	2,271,978	2,555,764	2,757,156	2,775,110	2,974,495

See footnote at end of table.

Schedule of projected long-term debt constant dollar basis—Continued

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT—Continued

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Principal repayments and sinking fund appropriations:										
Funded debt	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	30,620	60,352	80,231	107,926	148,109	186,472	219,827	249,680	268,562	301,753
Other noncurrent liabilities	0	0	0	0	0	0	0	0	0	0
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	30,620	60,352	80,231	107,926	148,109	186,472	219 827	249,680	268,562	301,753

Class I line-haul railroads-western distict, excluding Chicago, Rock Island & Pacific R.R. Co.

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Yearend long-term debt balance:										
Funded debt	0	0	0	0	0	0	0	0	0	0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	927,617	1,754,106	2,168,225	2,705,315	3,499,764	4,190,512	4,701,204	5,106,380	5,126,861	5,485,443
Other noncurrent liabilities[1]	247,922	262,922	277,922	292,922	307,922	322,922	337,922	352,922	367,922	382,922
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	1,175,539	2,017,028	2,446,147	2,998,237	3,807,686	4,513,434	5,039,126	5,459,302	5,494,783	5,868,365
Principal repayments and sinking fund appropriations:										
Funded debt	0	0	0	0	0	0	0	0	0	0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	66,257	130,023	168,888	219,313	291,722	361,896	424,222	483,463	519,457	582,173
Other noncurrent liabilities	0	0	0	0	0	0	0	0	0	0
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	66,257	130,023	168,888	219,313	291,722	361,896	424,222	483,463	519,457	582,173

---

[1] Represents payables to affiliates.

Schedule of projected long-term debt constant dollar basis—Continued

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICT, EXCLUDING BANKRUPT ROADS

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Yearend long-term debt balance:										
Funded debt	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	285,463	564,811	734,034	964,678	1,319,999	1,628,472	1,847,209	1,997,842	2,004,605	2,147,102
Other noncurrent liabilities[1]	626,626	646,418	666,210	686,002	705,794	725,586	745,378	765,170	784,962	804,754
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	912,089	1,211,229	1,400,244	1,650,680	2,025,793	2,354,058	2,592,587	2,763,012	2,789,567	2,951,856
Principal repayments and sinking fund appropriations:										
Funded debt	0	0	0	0	0	0	0	0	0	0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	20,388	41,794	56,863	77,397	108,304	138,071	163,554	185,994	199,759	224,203
Other noncurrent liabilities	0	0	0	0	0	0	0	0	0	0
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	20,388	41,794	56,863	77,397	108,304	138,071	163,554	185,994	199,759	224,203

Class I line-haul railroads-southern district

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Yearend long-term debt balance:										
Funded debt	0	0	0	0	0	0	0	0	0	0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	469,752	927,338	1,204,650	1,618,631	2,261,396	2,852,176	3,327,380	3,711,207	3,821,625	4,296,715
Other noncurrent liabilities[1]	72,136	75,388	78,641	81,893	85,146	88,398	91,651	94,903	98,156	101,408
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	541,888	1,002,726	1,283,291	1,700,524	2,346,542	2,940,574	3,419,031	3,806,110	3,919,781	4,398,123

See footnote at end of table.

Schedule of projected long-term debt constant dollar basis—Continued

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT—Continued

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Principal repayments and sinking fund appropriations:										
Funded debt	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment, debt	33,551	68,630	93,338	129,572	184,736	240,128	291,220	339,436	371,568	432,041
Other noncurrent liabilities	0	0	0	0	0	0	0	0	0	0
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	33,551	68,630	93,338	129,572	184,736	240,128	291,220	339,436	371,568	432,041

Inflated dollar basis class I line-haul railroads-western district, excluding Chicago, Rock Island & Pacific R.R. Co.

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Yearend long-term debt balance:										
Funded debt	0	0	0	0	0	0	0	0	0	0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	1,016,823	1,998,262	2,527,437	3,255,563	4,385,804	5,443,624	6,318,476	7,101,372	7,306,397	8,192,588
Other noncurrent liabilities[1]	247,922	262,922	277,922	292,922	307,922	322,922	337,922	352,922	367,922	382,922
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	1,264,745	2,261,184	2,805,359	3,548,485	4,693,726	5,766,546	6,656,398	7,454,294	7,674,319	8,575,510
Principal repayments and sinking fund appropriations:										
Funded debt	0	0	0	0	0	0	0	0	0	0
Bond refinancing	0	0	0	0	0	0	0	0	0	0
Equipment debt	72,628	147,916	196,277	262,304	361,769	463,167	558,737	654,567	715,964	830,402
Other noncurrent liabilities	0	0	0	0	0	0	0	0	0	0
Debt in default	0	0	0	0	0	0	0	0	0	0
Total	72,628	147,916	196,277	262,304	361,769	463,167	558,737	654,567	715,964	830,402

---

[1] Represents payables to affiliates.

Forecast Methodology No. 11

WORKING CAPITAL PROJECTIONS

This section explains the forecasting of all current assets and current liabilities. Current liabilities were projected independently and provided a basis to determine a minimum level of current assets needed to maintain railroad operations. The minimum level of current assets was determined by applying a current ratio to current liabilities. For example, with a total amount of current liabilities of $100 and a current ratio of 1.5, current assets would be $150 ($100 x 1.5). The trend over the period 1962-74 indicates a steady decline of the current ratio on a regional basis. Base year 1974's current ratios were used as factors to determine the minimum level of current assets based on the rationale that, as a minimum, the present liquidity position of railroads should be maintained against future deterioration. The current ratios used were:

Eastern district, excluding bankrupts and ConRail	1.38
Southern district	1.30
Western district, excluding Rock Island	1.24

Current assets were distinguished as cash, receivables, materials and supplies, and other assets. Each of these components, except cash, was forecasted independently, and cash was computed as the residue of the minimum amount of total current assets minus receivables, materials and supplies, and other assets. Current liabilities were broken down into loans and accounts payable, interest payable, dividends payable, taxes payable, and other liabilities. All of these current liability components were projected independently.

Receivables for each district were projected by means of a regression equation with the sum of operating revenues, rental income and other income as the independent variable. The regression analysis which established this equation was performed over a historical series of 13 years (1962-74).[41] It was assumed that the collection cycle remains relatively stable and the level of receivables is, therefore, dependent on the level of revenues. The regression equation for each district has the following parameters:

Districts	a	b	r^2	t value
East less bankrupts and ConRail	-143,459	0.1853143	0.90981	10.5345
South	-232,265	0.2380907	0.99118	35.2015
West less Rock Island	-149,844	0.1360956	0.89232	9.5460

Regression analysis was also used in projecting materials and supplies. In this regression equation, the sum of fuel, and materials and supplies in operating expenses was used as an independent variable, assuming that the level of inventory would vary with operating needs. These regression equations have the following parameters:

---

[41] This time series is being updated in the computer program to the latest data available. Failure to incorporate the 1975 data in this regression analysis has only negligible impact on the coefficients.

Districts	a	b	r^2	t value
East less bankrupts and ConRail	32,333	0.16725	0.84792	7.8335
South	22,652	0.17222	0.88792	9.3345
West less Rock Island	48,594	0.21140	0.93085	9.5576

"Other assets" as a group were projected by applying a ratio to operating revenues. The ratios for the three districts were determined on the basis of their trend over the latest 5 years. The ratios used were:

	Percent
Eastern, excluding bankrupts and ConRail	1.67
Southern	0.56
Western, excluding Rock Island	0.44

On the liability side, the projection for loans and accounts payable was based on regression equations using cash expenses as an independent variable. Cash expenses consist of operating expenses minus depreciation and retirements plus tax and rental expenses. The underlying assumption was that with a stable payment cycle, the balance of payables would be related to expenses that require cash payments. These equations have the following parameters:

Districts	a	b	r^2	t value
East less bankrupts and ConRail	-92,442	0.2405	0.94455	13.6812
South	-72,797	0.2058	0.97761	21.9058
West less Rock Island	-63,090	0.1835	0.82438	7.1869

Interest, tax, and dividend payables were projected separately in the following proportionate relationships to interest expense, dividend appropriations, and tax expense:

	East less bankrupts and ConRail	South	West less Rock Island
Ratio of interest payable to interest expense	0.2869	0.3157	0.4051
Ratio of dividends payable to total dividends	0.0140	0.0482	0.1049
Ratio of taxes payable to total tax expense	0.5000	0.3168	0.2951

In summary, the following steps were followed:

(1) projection of current liabilities, consisting of loans and accounts payable, taxes payable, interest payable, dividends payable, and other liabilities;

(2) determination of the minimum level of current assets by applying a constant current ratio to total current liabilities;

(3) projection of receivables, materials and supplies, and other assets;

(4) computation of cash by subtraction of items projected in (3) above from the minimum amount of current assets determined in step (2) above.

Cash allowed in the rate base.—The amount of cash allowed in the rate base was determined as the lesser of (1) the projected cash balance in the pro-forma balance sheet, and (2) 15 days projected cash operating expenses (operating expenses minus depreciation and property retirements plus rent and tax payments). The criterion of 15 days cash operating expenses has been used by the Section of Cost and Valuation of the Bureau of Accounts as the "buffer fund allowance" in its formula for computing railroad working capital allowance.

Forecast Methodology No. 12

PROJECTED INTEREST EXPENSE

Introduction.—Projection of the railroads' interest expense requires the totaling of numerous, separate forecast methodologies. Basically, this projected expense is a function of forecasted interest rates and forecasted levels of both long-term and unfunded debt. The scheduling of railroad debt is covered in Forecast Methodology No. 6—*Retirement Schedule of Existing Debt*, and Forecast Methodology No. 10—*Schedule of New Debt*. Herein covered are the forecasting of interest rates applicable to railroad debt forms, and the composition of the interest expenses shown in the forecasted income statements.

Interest rates and interest expenses are examined as they relate to both existing and new debt.[42] Debt is considered to include bonds (funded debt), equipment obligations, miscellaneous debt, debt due to affiliates, debt in default, and unfunded debt.[43]

Following are the methodologies, first, for the forecasting of interest rates, and second, for the forecasting of interest expense on long-term and unfunded debt.

Interest rates/funded debt and equipment obligations.—Rates applicable to existing funded debt and equipment obligations are known from information in the railroads' R-1 Annual Reports to the Commission, schedule 218. Some railroads pay interest on equipment obligations at a rate which is keyed to the commercial bank prime lending rate. In order to quantify the interest expenses in these instances, Data Resources, Inc., projections of the prime rate were adopted.[44] Interest expenses on existing debt are, therefore, the products of known interest rates times the scheduled debt balances. These expenses are shown in the latter sections of this forecast methodology.

Future interest rates on new funded debt and equipment obligations, used to compute interest expense, have been projected both on the basis of our own independent statistical analysis of interest rate determinants and on the basis of related forecasts by DRI. Interest expenses in 1976 and in 1977-85 are based on interest rate forecasts by the Coordinator and by DRI, respectively.

---

[42] "Existing debt" is that outstanding at the end of the year immediately preceding the first forecast year. "New debt" is all debt which is incurred beginning with the first forecast year.

[43] In the forecasted balance sheet, Miscellaneous Debt and Debt Due to Affiliates are combined to form the category "Other Noncurrent Liabilities." Also, there is no "unfunded debt" account, per se, in the balance sheet; unfunded debt is comprised of several current liability items.

In the forecasted income statement, interest expenses applicable to the debt forms listed above are classified as either Interest on Funded Debt or Interest on Unfunded Debt.

[44] *The Data Resources U.S. Long-Term Review*, Summer 1975 (Lexington, Massachusetts: Data Resources, Inc., 1975), pg. 49. Prime rate forecasts are 1976, 7.14%; 1977, 8.07%; 1978, 7.44%; 1979, 6.63%; 1980, 6.84%; 1981, 8.17%; 1982, 8.04%; 1983, 8.17%; 1984, 8.45%; 1985, 7.94%.

The statistical analysis underlying the 1976 interest rate forecasting methodology is based on the concept that annual changes in interest rates are basically a function of two forces: (1) changes in the annual rate of inflation, and (2) changes in the supply of and demand for money. The Consumer Price Index ("CPI") was used as the inflation index; while the Federal Government budget surplus or deficit and total private industry spending on plant and equipment were used to represent the demand for money; and the Federal Reserve's basic money supply measure, "M_1", was used to measure the supply of money in the U.S. economy.[45] These data are shown below in table No. 12-1:

Regression analysis was used to relate these data, after modification, to historical railroad bond yields. An equation was thereby established which expresses the correlative nature of the variables and can, therefore, be used as a predictive tool to forecast, as accurately as possible, interest rates one year out. The above data were modified for the analysis as follows:

TABLE 12-2

Year	Railroad bond yields (V_1)	Annual rate of change in CPI (V_2)	Supply-demand ratio (V_3)
	Percent		
1955	3.34	-0.37	4.13
1956	3.65	1.50	4.30
1957	4.32	3.56	3.94
1958	4.39	2.73	3.97
1959	4.75	0.81	3.09
1960	4.92	1.60	3.93
1961	4.86	1.01	3.73
1962	4.86	1.12	3.29
1963	4.65	1.21	3.39
1964	4.67	1.31	3.03
1965	4.72	1.72	2.98
1966	5.37	2.86	2.60
1967	5.89	2.88	2.45
1968	6.77	4.20	2.09
1969	7.46	5.37	2.62
1970	9.04	5.92	2.62
1971	8.38	4.30	2.22
1972	7.98	3.30	2.20
1973	8.12	6.23	2.31
1974	8.98	10.97	2.40
1975	9.39	9.14	1.85

Source: Variable one (V_1), railroad bond yields, is from *Business Statistics* and *Survey of Current Business*, pages 105 and S-21, respectively. These yields are averages of yields on 10 AA bonds, 10 A bonds, and 10 Baa bonds.

The Coordinator sought to prove that the movement in interest rates in general, and railroad bond yields in particular, is highly influenced by inflation and supply and demand factors related to the availability of money. Theoretically, interest rates should rise with inflation (positive correlation) since investors will seek to recover the lost purchasing power of the principal they invest by means of higher rates of return on that money. In addition, as the supply-demand ratio is meant to show, the money supply relative to the total of Federal Government budget deficits (representing net Federal financing) and private industry spending should move in a direction opposite to interest rates (negative correlation).[46] When the rate of CPI change and the supply-demand ratio (independent variables) were related to railroad bond yields (dependent variable) by regression analysis, these theories were borne out:

---

[46] The supply-demand ratio is calculated from data in table 12-1. Money supply (M_1) is divided by the sum of industry spending plus the Federal deficit or minus the Federal surplus.

TABLE 12-3

Railroad bond yield regression analysis data from 1955-75

Coefficient of determination(R^2)	0.879
Standard error of estimate	0.711
Intercept	8.518
Coefficients:	
V_2	0.372
V_3	-1.250

A reasonably good correlation exists between the variables, as measured by the coefficient of determination of 0.879. The next forecasting step was to insert predictions of the independent variables in the equation derived from the regression analysis, $V_1 = 8.518 + 0.372V_2 - 1.250V_3$. The rate of inflation, or annual rate of growth in the CPI during 1976, is expected to approximate 5.9 percent. This prediction is the consensus of economists working for large U.S. corporations and forecasts generated by various econometric services tabulated in a December 29, 1975, *Business Week* article on the outlook for the U.S. economy in 1976 (pp. 44-47). The CPI actually rose from 166.3 in December 1975 to 168.2 in April 1976, or at an annualized rate of 3.4 percent (*Survey of Current Business*, p. S-8). As the economy continues towards full recovery in 1976, and existing productive capacity undergoes increasingly greater utilization, this rate is likely to rise and therefore coincide more closely with the 5.9-percent rate expected for the entire year.

It was assumed the money supply will grow by 5.75 percent in 1976. This is the midpoint between the 4 1/2 to 7 percent growth range Federal Reserve Chairman Arthur Burns has publicly targeted for the Board.

The Federal deficit in calendar year 1976 is expected to be about $60 billion. This figure is computed by averaging the approximate fiscal year 1976 deficit of $75 billion and the deficit of $45 billion predicted in the *Business Week* article noted above for fiscal year 1977.[47]

A prediction for the amount of spending by total industry on plant and equipment in 1976 was taken from the *Data Resources U.S. Short-Term Review*, July 1976. This prediction of $123.3 billion was finally added to the assumed Federal deficit of $60 billion to form the denominator of the supply-demand ratio, $183.3 billion. The numerator was obtained by applying the 1976 money supply growth estimate of 5.75 percent to the average 1975 money supply of $289.6 billion for a figure of $306.3 billion. The supply-demand ratio which results from these variables is 1.67.

By reference to table 12-2 it will be seen that the projected supply-demand ratio of 1.67 represents a further drop in this index, following a ratio of 1.85 in 1975. This is expected to occur because, while businessmen's spending plans are relatively moderate in view of the shortages of productive capacity which occurred in 1974, the Federal Government is expected to continue with its series of large deficits, contributed to largely by such antirecession measures as the tax cut which was enacted last year. At the same time, the Federal Government aims to limit money supply growth for purposes of controlling inflation, thus the estimate of a 5.9-percent rate of growth in the CPI in 1976, far lower than the 10.97-percent rate of 1974 and the 9.14-percent rate of 1975. The lower 1976 supply-demand ratio will then exert upward pressure on railroad bond yields, as railroads and other industries compete with the Government for capital; but the relatively modest 5.9-percent rate of inflation, as measured by the CPI, should exert a greater opposite pressure on interest rates such that the yield on the average railroad bond issue in 1976 falls from the 9.39-percent rate of 1975.

---

[47] The fiscal year 1976 Federal deficit is now known to have been closer to $68 billion. Budget analysts, however, attribute this to the Government's deferral of certain expenditures. The fiscal year 1977 budget deficit forecast can, therefore, be expected to increase by the difference while leaving the forecasted calendar year 1976 deficit of $60 billion unchanged.

Plugging the projected independent variables into the regression equation results in the following projection of average railroad bond yields for 1976:[48]

$$V_1 = 8.518 + 0.372\ (5.9) - 1.250\ (1.67)$$

$$V_1 = 8.518 + 2.195 - 2.088$$

$$V_1 = 8.625\%$$

This rate is applied to bond refinancings assumed for 1976 and is also the rate to which the projected rate on new equipment obligation issues is keyed.

Equipment obligation yields have historically maintained a close correlation with railroad bond yields and have been forecasted in relation to those yields. In order to regress historical equipment obligation yields on bond yields to establish a linear relationship for forecasting purposes, a sample of equipment obligations was first compiled. Similar in design to the railroad bond sample described earlier in the note to table 12-2, the sample consists of four equipment obligations (one rated AAA, one AA, one A, and one Baa) for which the yields to maturity have been computed and averaged together for each year from 1959-74. The sample railroads and their equipment obligations used to create the final index of average equipment obligation yields are shown in table 12-5.

---

[48] The term "yield" is used interchangeably with the term "rate" throughout this methodology. The interest rate projection for the first forecast year actually represents both (1) the *yield* on the average railroad bond already issued and selling in the secondary market, and (2) the *rate* on the average new-issue railroad bond selling in the primary market.

TABLE 12-4

Equipment obligation yields, 1959-74

Year	AAA-rated			AA-rated			A-rated			Baa-rated		
	RR	#	Yield	RR	#	Yield	RR	#	Yield	RR	#	Yield
			Percent			*Percent*			*Percent*			*Percent*
1959	DRGW	1	4.17	NPR	1	4.42	MP	1	4.86	------------	---------	NA
1960	DRGW	2	4.69	NPR	5	4.02	MP	3	5.13	NYC	3	5.43
1961	DRGW	3	4.44	NPR	6	4.36	MP	5	4.40	NYC	5	5.04
1962	DRGW	4	4.18	NPR	7	4.03	MP	6	4.15	TT	1	4.73
1963	DRGW	5	4.03	NPR	8	4.01	MP	8	4.25	NYC	6	4.39
1964	DRGW	6	4.33	NPR	10	4.36	MP	10	4.50	NYC	9	4.61
1965	DRGW	7	4.29	NPR	12	4.51	MP	11	4.37	PR	1	5.34
1966	ATSF	1	5.44	GNR	32	5.36	MP	12	4.90	PR	2	5.34
1967	DRGW	10	5.43	GNR	34	5.60	MP	13	5.44	NYC	18	5.86
1968	DRGW	11	6.07	GNR	36	6.06	MP	15	6.61	TT	19	7.00c
1969	DRGW	12	7.02	GNR	39	7.60	MP	18	7.36	TT	23	8.50c
1970	UP	3	8.81	BN	65	9.30	MP	21	8.97	TT	27	10.50c
1971	ATSF	3	7.41	BN	68	7.64	MP	23	8.27	TT	29	8.59c
1972	ATSF	7	7.08	BN	70	7.10	MP	25	7.33	TT	30	7.66c
1973	ATSF	9	7.30	BN	73	7.32	SOO	11	7.83	TT	32	8.50c
1974	ATSF	10	9.71	BN	76	9.80	MP	27	8.14	TT	33	8.71c

NOTE: "c" means coupon rate, information not available to compute yield to maturity; all railroad abbreviations from *Transport Statistics* except: NPR—Northern Pacific Railway, GNR—Great Northern Railway, NYC—New York Central, PR—Pennsylvania Railroad, and TT—Trailer Train; # refers to the number assigned to the issue in *Moody's Transportation Manual* (1974), which is the source of the above data.

The averages of these yields are as follows:[69]

TABLE 12-5

Average equipment obligation yields, 1959-74

Year	Yield
	Percent
1959	4.48
1960	4.82
1961	4.56
1962	4.27
1963	4.17
1964	4.45
1965	4.63
1966	5.26
1967	5.58
1968	6.44
1969	7.62
1970	9.40
1971	7.98
1972	7.29
1973	7.74
1974	9.09

A statistical analysis was made, regressing these rates on the railroad bond yields shown in table 12-2. The results are as follows:

TABLE 12-6

Equipment obligation yield regression analysis data from 1959-74

Coefficient of determination(R^2)	0.9789
Standard error of estimate	0.2728
Intercept	-0.5340
Coefficient: V_2	1.0484

This established a very high correlation between the two variables ($R^2 = 0.9789$) and prompted the use of the regression equation $V_1 = -0.5340 + 1.0484\ V_2$ (where V_1 = interest rates on equipment obligations and V_2 = railroad bond yields) to forecast equipment obligation rates. This equation yields a rate for new equipment obligation issues in 1976 of:

---

[69] It is anticipated that the data in table 12-4 on which these average yields are based will later be expanded to include a larger and more representative sample of roads.

$$V_1 = -0.5340 + 1.0484\ (8.625)$$

$$V_1 = -0.5340 + 9.042$$

$$V_1 = 8.508\%$$

To summarize, the tools developed thus far permit the independent forecasting of bond rates in the first forecast year, and on the basis of bond rates, equipment obligation rates. These same tools have not been used to forecast interest rates for forecast years 2 through 10, however, since projections of the necessary independent variables for more than 1 year out could not possibly be relied upon. Instead, DRI projections of Treasury Bond rates (since DRI does not project interest rates specifically applicable to railroad securities) become the basis for rates on new issues of railroad bonds and equipment obligations in these later years.

Statistical regression analysis was again used to relate historical Treasury bond yields to railroad bond yields, and establish a mechanism for forecasting rates on railroad securities past one year. Treasury bond yields over the 1955-75 period have been as follows:

TABLE 12-7

Average Treasury bond yields, 1955-75

Year	Yield
	Percent
1955	2.84
1956	3.08
1957	3.47
1958	3.43
1959	4.07
1960	4.01
1961	3.90
1962	3.95
1963	4.00
1964	4.15
1965	4.21
1966	4.66
1967	4.85
1968	5.25
1969	6.10
1970	6.59
1971	5.74
1972	5.63
1973	6.30
1974	6.99
1975	6.98

Source: *Business Statistics* (1973), p. 103, and *Survey of Current Business*, p. S-21.

Regressing railroad bond yields from table 12-2 on these historical Treasury bond rates result in the following:

TABLE 12-8

Railroad bond yield regression analysis data from 1955-74

Coefficient of determination(R^2)	0.9613
Standard error of estimate	0.3917
Intercept	-1.0445
Coefficient: V_2	1.4815

Noting that the correlation between yields on these two types of securities was favorable ($R^2 = 0.9613$), the regression equation $V_1 = -1.0445 + 1.4815\,V_2$ was used to key railroad bond yields to Treasury bond yields in 1977-85, and, in turn, equipment obligation yields to railroad bond yields. Table 12-9 below shows the yields forecast by DRI for Treasury bonds and the forecasted yields on railroad securities.

TABLE 12-9

Forecasted railroad bond and equipment obligation yields, keyed to Treasury bond yields, 1977-85

Year	Treasury bond yields	Railroad bond yields	Equipment obligation yields
	percent		
1977	6.94	9.24	9.15
1978	6.87	9.13	9.04
1979	6.70	8.88	8.77
1980	6.88	9.15	9.06
1981	7.08	9.44	9.36
1982	7.15	9.55	9.48
1983	7.14	9.53	9.46
1984	7.13	9.52	9.45
1985	7.07	9.43	9.35

Interest rates/miscellaneous debt.—A portion of the railroads' interest expense is paid on miscellaneous debt, usually intermediate-term credit agreements or notes. While the railroads will probably continue to use this form of debt in the future, it is nevertheless minor in amount, and none has been forecast. That leaves only interest on existing miscellaneous debt at rates disclosed in the R-1 Annual Reports.

Interest rates/debt payable to affiliates.—Debt payable to affiliates has been forecasted differently from the other forms of debt. Since this credit is often extended to the railroads on an "open account" basis—i.e., with no fixed maturity—it is impossible to determine when the bulk of existing affiliate debt will expire. Also, since this debt is not assumed for specific purposes, such as equipment needs, it is difficult to forecast the amounts of new affiliate debt which the railroads will assume during the forecast period.

Instead, the annual outstanding balance of affiliate debt has been extrapolated from historical trends, which show a steady increase in the use of this debt form. Against each forecast year debt balance, then, an appropriate interest rate has been applied to derive an estimated interest expense.

Interest rates applicable to forecasted levels of affiliate debt have been approximated by actual 1975 rates. The rationale for this is that many individual obligations to affiliates bear no interest, while some bear "token" interest, and others bear interest at rates commensurate with current money market rates. The combination of the three does not easily lend itself to forecasting, and may not even change significantly in the future.

Interest rates for the solvent were developed as follows:

TABLE 12-10

Interest rates on debt payable to affiliates
(Thousands of dollars)

	East less bankrupts and ConRail	South	West less Rock Island
1975 interest accrued	$6,434	$193	$1,925
1975 average affiliate debt balance	599,758	66,134	215,094
Interest rate applicable to future levels of affiliate debt (percent).	1.0728	0.2918	0.8950

Interest rates/unfunded debt.—Separate from interest on long-term debt, the railroads pay interest, discounts and related expenses on short-term notes payable and other current liabilities (unfunded debt), many of which are not detailed in their annual report current liability schedules or elsewhere. It was hoped, therefore, that this interest item might exhibit an historical percentage relationship to loans and notes payable or to total current liabilities at least as stable as the 1971-75 trend in money market rates. Such a relationship was not established since the percentages varied too widely over the selected historical period:

TABLE 12-11

(Millions of dollars)

	1975	1974	1973	1972	1971
East less Bankrupts and ConRail					
(1) Interest on unfunded debt	$3.911	$4.244	$3.969	$3.658	$3.854
(2) Current liabilities	844.3	797.4	720.2	626.9	606.3
(3) (1) as a percent of (2)--percent	0.49	0.53	0.55	0.58	0.64
(4) Loans and notes payable	23.30	15.86	1.100	1.810	0.470
(5) (1) as a percent of (4)--percent	17.8	26.8	360	202	820
South:					
(1) Interest on unfunded debt	2.203	1.017	0.285	0.906	0.734
(2) Current liabilities	673.8	670.1	530.3	470.7	456.9
(3) (1) as a percent of (2)--percent	0.33	0.15	0.05	0.19	0.16

TABLE 12-11—Continued

	1975	1974	1973	1972	1971
(4) Loans and notes payable	3.664	5.975	1.999	1.997	4.679
(5) (1) as a percent of (4)--percent	69.3	17.0	14.3	45.4	15.7
West less Rock Island:					
(1) Interest on unfunded debt	8.010	2.511	5.083	7.049	8.047
(2) Current liabilities	1,527	1,502	1,351	1,294	1,318
(3) (1) as a percent of (2)--percent	0.53	0.17	0.38	0.55	0.61
(4) Loans and notes payable	21.66	44.35	17.30	106.7	131.3
(5) (1) as a percent of (4)-- percent	37.0	5.7	29.4	6.6	6.1

It was concluded that until the specific elements of unfunded debt to which this expense applies can be isolated and accurately forecasted, Interest on Unfunded Debt will be reflected in the projected Income Statements as an average of the actual expense for 5 years prior to the first forecast year.

	Interest on unfunded debt forecast 1976-85
	(Millions of dollars)
East less bankrupts and ConRail	$3.973
South	1.029
West less Rock Island	6.140

Interest expense/funded debt.—Interest on funded debt includes four items; interest on funded debt not in default ("funded debt" here meaning bonds, equipment obligations, miscellaneous obligations, and payables to affiliates), interest on debt in default, contingent interest (i.e., interest contingent on earnings), and amortization of debt discount and expense. These interest expense items have in most cases been forecasted by applying the interest rates developed in the earlier section of this methodology and the embedded rates on existing debt to the annual averages of debt balances shown in Forecast Methodology Nos. 6—*Retirement Schedule of Existing Debt* and 10—*Schedule of New Debt.*Amortization of debt discount and expense, an insignificant noncash item, has been estimated in all forecast years at its actual 1975 level.

The schedules below show how interest on funded debt, as it appears on the various projected income statements, is broken down between interest applicable to different categories of long-term debt. Contingent interest paid on long-term obligations generally known as "income bonds" is included in interest on other bonds (funded debt). Interest on miscellaneous obligations and on payables to affiliates is shown under the heading of other noncurrent liabilities.

Schedule of projected interest expense

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICT, EXCLUDING BANKRUPT ROADS

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Existing & new debt-constant dollar basis:										
Funded debt	34,569	34,026	32,530	30,336	28,577	28,502	28,255	26,386	25,726	24,794
Equipment debt	91,733	107,435	111,826	119,868	137,858	152,962	160,891	164,377	158,972	160,506
Other noncurrent liabilities	7,956	7,372	7,387	7,515	7,650	7,846	8,050	8,253	8,457	8,661
Debt in default	0	0	0	0	0	0	0	0	0	0
Amortization debt discount expense	1,020	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317
Total	135,278	150,150	153,060	159,036	175,402	190,627	198,513	200,333	194,472	195,278
Existing & new debt-inflated dollar basis:										
Funded debt	34,569	34,026	32,530	30,336	28,577	28,502	28,255	26,386	25,726	24,794
Equipment debt	94,006	114,043	121,984	135,678	163,931	189,981	207,722	219,721	217,925	229,946
Other noncurrent liabilities	7,956	7,372	7,387	7,515	7,650	7,846	8,050	8,253	8,457	8,661
Debt in default	0	0	0	0	0	0	0	0	0	0
Amortization debt discount expense	1,020	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317
Total	137,551	156,758	163,218	174,846	201,475	227,646	245,344	255,677	253,425	264,718

Class I line-haul railroads-southern district

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Existing & new debt-constant dollar basis:										
Funded debt	43,730	42,946	42,147	41,576	40,227	40,969	41,551	40,864	40,226	36,190
Equipment debt	140,122	167,825	178,093	196,527	231,947	263,909	286,072	300,924	297,853	313,093
Other noncurrent liabilities	529	300	252	248	256	264	272	281	290	299
Debt in default	0	0	0	0	0	0	0	0	0	0
Amortization debt discount expense	2,509	2,610	2,610	2,610	2,610	2,610	2,610	2,610	2,610	2,610
Total	186,890	213,681	223,102	240,961	275,040	307,752	330,505	344,679	340,979	352,192

Schedule of projected interest expense

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT—Continued

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Existing & new debt-inflated dollar basis:										
Funded debt	43,730	42,946	42,147	41,576	40,227	40,969	41,551	40,864	40,226	36,190
Equipment debt	143,859	178,651	194,730	223,224	277,075	329,664	372,180	406,532	413,940	457,908
Other noncurrent liabilities	529	300	252	248	256	264	272	281	290	299
Debt in default	0	0	0	0	0	0	0	0	0	0
Amortization debt discount expense	2,509	2,610	2,610	2,610	2,610	2,610	2,610	2,610	2,610	2,610
Total	190,627	224,507	239,739	267,658	320,168	373,507	416,613	450,287	457,066	497,007

Class I Line-Haul Railroads-Western District, excluding Chicago, Rock Island & Pacific R.R. Co.

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Existing & new debt-constant dollar basis:										
Funded debt	90,102	91,286	92,120	91,837	89,923	87,128	85,703	87,102	86,271	85,899
Equipment debt	264,542	327,415	349,586	382,668	445,260	502,391	543,323	575,104	569,135	597,439
Other noncurrent liabilities	9,115	7,325	6,041	5,459	5,181	4,978	4,692	4,594	4,589	4,562
Debt in default	149	149	149	149	149	149	149	149	149	149
Amortization debt discount expense	2,025	1,865	1,865	1,865	1,865	1,865	1,865	1,865	1,865	1,865
Total	365,933	428,040	449,761	481,978	542,378	596,511	635,732	668,814	662,009	689,914
Existing & new debt-inflated dollar basis:										
Funded debt	90,102	91,286	92,120	91,837	89,923	87,128	85,703	87,102	86,271	85,899
Equipment debt	272,665	350,811	384,266	435,416	530,955	625,654	704,657	776,014	790,246	872,879
Other noncurrent liabilities	9,115	7,325	6,041	5,459	5,181	4,978	4,692	4,594	4,589	4,562
Debt in default	149	149	149	149	149	149	149	149	149	149
Amortization debt discount expense	2,025	1,865	1,865	1,865	1,865	1,865	1,865	1,865	1,865	1,865
Total	374,056	451,436	484,441	534,726	628,073	719,774	797,066	869,724	883,120	965,354

Forecast Methodology No. 13

RENT FOR LEASED ROADS AND EQUIPMENT

Rent for leased roads and equipment applies to leased roads, tracks, bridges and other forms of railroad property (equipment) not covered in other rental accounts. In many cases, these types of leases endure for a hundred years or more and district rents consequently remain fairly constant over time. A look at the railroads' recent rents under this lease category bears this out:

TABLE 13-1

Rents for leased roads and equipment
(Thousands of dollars)

	1975	1974	1973	1972	1971	1970
East less bankrupts and ConRail.	$10,959	$10,784	$11,399	$11,988	$11,442	$11,154
South	13,130	12,975	12,056	11,726	12,482	11,325
West less Rock Island	1,681	1,616	1,768	1,756	1,776	2,267

Source: R-1 Annual Reports to the Commission

Due to the constancy of these rents, they have been recorded in each of the forecast years at their 1975 levels. Any changes in these figures will be noted and reflected in the model.

Forecast Methodology No. 14

NEW EQUIPMENT LEASES

The magnitude of the railroads' lease payments on new equipment leases for freight cars depends on the "lease-buy mix"—i.e., the proportions of all projected equipment acquisitions that are leased and that are purchased with borrowed funds.[50] This mix is also the basis for the forecast of new debt and interest expense associated with freight car expenditures.

Two methods of determining this mix were considered. The first was to analyze the trends, by district, of freight car leasing over the 1966-75 period, and then decide upon a mix for the forecast period based on a continuation of those trends. The second method was to establish a set of regression equations for the forecasting of this mix, based on relationships between the railroads' cash flow and tax liabilities, on the one hand, and their propensity to fill their equipment requirements through leasing, on the other hand. The first of these methods was implemented due to difficulties encountered with the second method, which are discussed later.

Lease-buy mix.—The collection of certain basic data preceded the implementation of either of the two methodologies. The following table shows the ratio of leased freight car units to the total of all freight cars bought, rebuilt, or leased in each year from 1966-75:

---

[50] Long-term locomotive lease payments are projected separately as a part of Forecast Methodology No. 9—*Rent Income and Rent Payable Excluding Freight Car Leases*. Debt financing of locomotives not leased was determined by the lease-buy mix for locomotives shown on page J-10-1 of Forecast Methodology No. 10—*Schedule of New Debt*.

TABLE 14-1

Historical lease-buy mix—freight cars

Year	Purchased	Leased	Rebuilt	Total	Percent of total leased
		East less bankrupts and ConRail			
1966	$11,587	$2,589	$8,127	$22,303	12
1967	12,556	2,116	6,421	21,093	10
1968	5,575	5,857	4,074	15,506	38
1969	8,172	5,764	2,166	16,102	36
1970	10,247	2,765	4,673	17,685	16
1971	3,767	5,924	1,493	11,184	53
1972	4,228	2,014	667	6,909	29
1973	4,741	1,039	628	6,408	16
1974	3,347	951	1,117	5,415	18
1975	10,688	1,716	888	13,292	13
Total	74,908	30,735	30,254	135,897	23
		South			
1966	16,331	1,075	3,847	21,253	5
1967	12,698	2,113	3,603	18,414	11
1968	11,932	2,444	1,732	16,108	15
1969	10,362	3,206	3,565	17,133	19
1970	12,142	4,536	5,041	21,719	21
1971	9,989	561	2,824	13,374	4
1972	4,033	260	2,197	6,490	4
1973	7,029	1,233	3,333	11,595	11
1974	9,304	948	978	11,230	8
1975	7,098	1,300	793	9,191	14
Total	100,918	17,676	27,913	146,507	12
		West less Rock Island			
1966	28,955	3,804	2,483	35,242	11
1967	24,822	4,848	2,767	32,437	15
1968	12,553	4,124	2,143	18,820	22
1969	17,304	3,007	1,746	22,057	14
1970	16,131	5,903	1,221	23,255	25
1971	17,062	2,364	1,178	20,604	11
1972	14,496	4,185	2,443	21,124	20
1973	14,442	2,456	2,607	19,505	13
1974	15,543	4,234	1,368	21,145	20
1975	16,363	3,111	719	20,193	15
Total	177,671	38,036	18,675	234,382	16

Source: R-1 Annual Reports to the Commission, schedule 417.

Analysis of these data revealed no trend in the leasing of freight cars by the different districts. It was decided, therefore, to adopt the average 10-year percentage of leased to total acquisitions for the projected mix:

TABLE 14-2

Forecasted lease-buy mix constant over years 1975-84

District	Freight cars—percent of total leased
East, less bankrupts and ConRail	23
South	12
West, less Rock Island	16

Application of the percentages shown in table 14-2 to the forecasted freight car acquisitions shown in Forecast Methodology No. 4A—*Equipment Expenditure Projection* resulted in the following projected dollar amounts of leased freight cars:

TABLE 14-3

Dollar volume of leased freight cars (incl. cabooses) 1976-85

(THOUSANDS OF DOLLARS)

	East less bankrupts and ConRail	South	West less Rock Island
Constant dollars:			
1976	$75,070	$41,276	$168,213
1977	76,924	43,673	168,928
1978	51,427	29,134	99,764
1979	68,937	44,582	133,746
1980	104,080	70,821	203,191
1981	96,943	70,714	203,598
1982	76,695	60,406	180,295
1983	63,894	55,094	175,724
1984	35,629	33,997	104,303
1985	61,058	61,933	186,170
Inflated dollars:			
1976	82,351	45,280	184,529
1977	90,949	51,637	199,728
1978	64,176	36,357	124,498
1979	90,505	58,531	175,591
1980	143,271	97,488	279,701
1981	140,422	102,429	294,910
1982	117,980	92,922	277,344
1983	103,739	89,451	285,308
1984	61,183	58,379	179,111
1985	111,889	113,491	341,151

Lease payments.—In order to translate these costs of leased equipment into annual lease payments, the issues of maintenance and imputed interest had to be considered. It has been assumed that the projected leases are "capital," or "financing," leases. This means that the lessee railroads, through some type of renewal or purchase plan, will take possession of the properties at the end of the lease term. It is, therefore, their responsibility to maintain and insure those properties during the lease period. These costs, then, are included in the forecasted operating expenses while the lease payments reflect only the full depreciation of the properties and the lessor's profit. (See note to table 14-4 for further discussion of capital v. operating leases.)

The lessor's profit, or interest imputed to the projected leases, was determined by studying the historical relationship between this cost and interest rates applicable to equipment debt, which has a maturity similar in length to equipment leases. Shown below are interest rates imputed to the outstanding leases of selected railroads:

TABLE 14-4

Interest rates imputed to leases

Railroad	Interest rate range	Average interest rate as of:		
		1974	1973	1972
	Percent	*Percent*	*Percent*	*Percent*
Santa Fe	4.3-5.7	4.9	----------	----------
C & NW	3.7-6.8	----------	4.8	----------
Western Md	----------	8.0	----------	----------
Rio Grande	4.0-12.0	6.6	5.6	----------
Burlington Northern	4.0-10.0	----------	7.8	7.7
Milwaukee	4.5-10.4	7.2	6.9	----------
Erie Lackawanna	3.0-9.0	6.7	----------	----------

NOTE: The interest rates above relate to the railroads' financing leases. (Operating, or service, leases generally exist only in minor amounts.) Since the IRS does not allow the deductibility of lease payments under certain terms common to financing leases, however, the railroads apparently negotiate some terms which are more characteristic of service leases. Their financing leases are noncancellable, with the lessee maintaining the leased properties and the lease payments fully reimbursing the lessor for the cost of the properties. But, as is common to the service-type lease, the railroads' financing leases usually run 15 years, or less, than 75 percent of the economic life of the property, and allow the railroad to purchase the property at the end of the lease period at its fair market value—rather than at some negligible cost, due to its having been fully paid for over the lease life. The question of what the railroads will do at the end of the lease periods, with respect to the purchase option, has not been dealt with herein since the leases will terminate subsequent to the last forecast year.

SOURCE: Computed or taken directly from listed railroads' annual reports to stockholders dated as shown in the table.

Out of 20 major roads examined, only these 7 roads voluntarily disclosed lease-interest rate data in their stockholder annual reports. (This information is generally not available in the R-1 Annual Reports to the Commission except as disclosed in the years in which leases are actually negotiated.)

Deciding how to apply these findings constituted a problem. These are "embedded" lease costs based on all outstanding lease obligations as of either 1974, 1973, or

1972.[31] They are not the costs of current, individual lease obligations which could have been readily applied to forecasted leased-equipment costs.

Another problem was that these embedded costs vary considerably, both the ranges and average costs, between railroads. This is probably due to the fact that some roads pay a rate close to or exceeding that of equipment trust certificates, while others are able to negotiate with the lessor a significantly lower rate due to tax credits received by the lessor for his investment in the leased equipment. It was, therefore, difficult to generalize about the level of this cost for all railroads.

As an example, the four roads for which the embedded cost of leases is known as of 1973 also showed the following approximate, embedded costs of equipment debt in 1973:

TABLE 14-5

	Embedded cost of leases	Embedded cost of debt
	Percent	*Percent*
C & NW	4.800	8.100
Rio Grande	5.600	6.300
Burlington Northern	7.800	6.400
Milwaukee	6.900	6.300
Average	6.275	6.775

The average embedded cost of debt for these roads was found to be reasonably close to the average embedded cost of leases. The interest rate imputed to new equipment leases was, therefore, assumed to be the same rate as forecasted for equipment debt.

Annual lease payments on freight cars were finally forecast by dividing the equipments costs shown in table 14-3 by the following discount factors 15-year lease term and a rate of interest (lessor profit) equal to the rates projected for equipment obligations in Forecast Methodology No. 12—*Projected Interest Expense*:[32]

---

[31] An embedded cost, as applied to leases, is the weighted average cost of all lease obligations outstanding as of a certain date, and does not reflect any current or future costs which might tend to be greater than embedded costs.

[32] These discount factors were interpolated from a standard compound interest table for the present value of an annuity. In this exercise, the annuity is the "unknown," while its present value, the cost of the equipment to be leased, is known. That cost is divided by the appropriate discount factor to obtain a constant value for the annual lease payment.

TABLE 14-6

Freight car lease discount factors

Year	Factor
1976	8.30
1977	7.99
1978	8.04
1979	8.17
1980	8.03
1981	7.89
1982	7.84
1983	7.85
1984	7.85
1985	7.90

Projected annual long-term lease payments on freight cars, included in the Rents Payable account in the forecasted income statements, are as follows:

TABLE 14-7

Fixed annual payments on long-term freight car leases 1976-1985

(THOUSANDS OF DOLLARS)

	East less bankrupts and ConRail	South	West less Rock Island
Constant dollars:			
1976	$9,044	$4,972	$20,265
1977	9,626	5,465	21,141
1978	6,395	3,623	12,408
1979	8,437	5,456	16,369
1980	12,960	8,819	25,303
1981	12,286	8,961	25,804
1982	9,781	7,704	22,996
1983	8,138	7,018	22,384
1984	4,538	4,330	13,286
1985	7,728	7,838	23,565
Inflated dollars:			
1976	9,921	5,454	22,232
1977	11,382	6,462	24,996
1978	7,981	4,521	15,484
1979	11,077	7,163	21,491
1980	17,841	12,139	34,831
1981	17,797	12,982	37,377
1982	15,048	11,851	35,374
1983	13,214	11,394	36,344
1984	7,793	7,436	22,816
1985	14,162	14,365	43,183

NOTE: The lease payment shown for a particular year corresponds with the dollar volume of freight cars newly leased in that year. Total annual lease payments for any given year for new freight cars equal the payment shown for that year plus the payment shown for each preceeding year back to 1976.

Forecasting the lease-buy mix by regression analysis.—It was originally thought that the tendency to lease equipment, rather than purchase it with borrowed funds, could be related to and projected on the basis of historical correlations with the railroads' cash flow and tax liabilities. When a company purchases equipment it is permitted to deduct from its income tax liability a certain percentage of the cost of that equipment. If the company, however, produces little or no taxable income, then it cannot realize the savings inherent in the investment tax credit. It then seeks out a lessor which will purchase and lease to it the needed equipment and negotiate a favorable rental fee which reflects the tax credit (as well as the accelerated depreciation) that the lessor, as the owner, will take on the equipment.[53] So a railroad should theoretically lease a larger proportion of its equipment requirements when it expects present and future earnings, and, therefore, taxes, to decline. The purchase of equipment is also constrained by the availability of cash since most equipment debt requires a downpayment of approximately 20 percent. Obviously, a company must be less concerned about the relative long-run costs of a lease-buy choice if it lacks sufficient cash to make a downpayment in the first place. As cash flow declines, it can be expected to rely more on leasing since a lease is, in effect, 100 percent financing.

Other decision variables may make buying more attractive than leasing. For example, when an operating-type lease expires, the lessor, not the lessee, owns the equipment which presumably has some residual value. In certain instances, the lessee may pay a rate of interest (one component of the total lease payment) which is higher than the rate he might pay were he to finance the equipment himself. Finally, the Financial Accounting Standards Board may soon require that these leases be capitalized or, at least, noted on the balance sheet as long-term liabilities which would dangerously alter the debt-equity ratios and reduce the borrowing power of some companies. However, all of these drawbacks to leasing will be deemphasized in the lease-buy decision by a company which is not generating enough income, relative to its equipment needs, to provide the cash for a downpayment on new equipment.

Based on this rationale, regression analyses were made seeking a meaningful correlation between the railroads' historical cash flow as a percentage of equipment needs and tax liability as a percentage of equipment needs (independent variables), and the percentage of leased to total equipment acquisitions (dependent variable). While the expected, negative relationships were obtained, correlation measures were not impressive and led to the decision to implement the alternate methodology. It is anticipated, however, that such regressions can ultimately be formulated to ascertain if it yields a somewhat more meaningful and sophisticated means of projecting the lease-buy mix.

Forecast Methodology No. 15

RAILWAY TAX ACCRUALS

The Railway Tax Accrual account contains the following railroad tax elements: States taxes (income and property), Current and Deferred Federal income taxes, and Payroll taxes (old-age retirement and unemployment insurance). Since the railroads have not incurred excess profits taxes in the recent past, it has been assumed for the forecast period that none will be incurred, and that other U.S. Government taxes will be negligible. The methodologies for forecasting these various tax elements for the solvent roads are discussed below.

---

[53] See "New Freight Cars: Lease—or Buy" in the March 31, 1975, issue of *Railway Age*.

State taxes for the three nonbankrupt railroad groups have been forecast on the basis of average historical relationships between State taxes and taxable income, shown below:[34]

TABLE 15-1

State tax as a proportion of taxable income 1966-1975 (Thousands of dollars)

Year	State tax	Taxable income	Tax rate
East less bankrupts and ConRail			
			Percent
1966	$58,489	$390,695	15.0
1967	62,437	263,778	23.7
1968	64,905	297,184	21.8
1969	69,856	280,825	24.9
1970	71,924	261,603	27.5
1971	71,925	186,541	38.6
1972	71,691	270,699	26.5
1973	74,807	299,218	25.0
1974	80,542	429,622	18.8
1975	74,951	239,068	31.4
Total	701,527	2,919,232	24.0
South			
1966	54,880	269,421	20.4
1967	55,932	223,580	25.0
1968	56,257	227,719	24.7
1969	61,348	291,174	21.1
1970	63,278	304,394	20.8
1971	68,003	317,564	21.4
1972	68,307	382,300	17.9
1973	67,797	392,452	17.3
1974	79,449	460,664	17.3
1975	75,638	293,718	25.7
Total	650,889	3,162,985	20.6
West less Rock Island			
1966	142,792	742,687	19.2
1967	175,249	684,236	25.6

---

[34] Taxable Income is derived by adding back to Ordinary Income (before Extraordinary and Prior Period Items) other than U. S. Government Taxes (State Taxes), Federal Income Taxes, and Provision for Deferred Taxes. Deferred Taxes are estimated for years prior to 1974 as the difference between "Provision for income taxes based on taxable net income recorded in the accounts for the year" (Schedule 350 of R-1 Annual Report), and "Net applicable to the current year."

State tax as a proportion of taxable income 1966-75—Continued

Year	State tax	Taxable income	Tax rate
	West less Rock Island—Continued		
1968	$174,509	$741,937	23.5
1969	181,511	748,204	24.3
1970	186,968	717,276	26.1
1971	187,428	767,138	24.4
1972	191,947	897,566	21.4
1973	196,929	919,350	21.4
1974	214,304	983,826	21.8
1975	223,487	649,291	34.4
Total	1,875,124	7,851,513	23.9

Source: R-1 Annual Reports to the Commission.

Since State taxes are deductible from income taxed at the Federal level, similar average tax rates were developed for current and deferred Federal income taxes based on the taxable income shown above, less State taxes:

TABLE 15-2

Current and deferred Federal income taxes as proportions of taxable income 1966-1975
(Thousands of dollars)

Year	Current tax	Taxable income	Tax rate	Deferred tax	Tax rate
		East less bankrupts and ConRail			
			Percent		*Percent*
1966	$54,048	$332,205	16.3	$53,851	16.2
1967	17,880	201,341	8.9	51,719	25.7
1968	29,704	232,279	12.8	63,121	27.2
1969	17,704	210,969	8.4	64,822	30.7
1970	15,135	189,679	8.0	75,089	39.6
1971	17,045	114,616	14.9	28,525	24.9
1972	33,144	199,008	16.7	57,417	28.9
1973	47,670	224,411	21.2	66,661	29.7
1974	89,166	349,080	25.6	67,977	19.5
1975	27,033	164,117	16.5	37,711	23.0
Total	348,529	2,217,705	15.7	566,956	25.6

Current and deferred Federal income taxes as proportions of taxable income 1966-75 (Thousands of dollars)—Continued

Year	Current tax	Taxable income	Tax rate	Deferred tax	Tax rate
		South			
1966	$28,118	$214,541	13.1	$43,336	20.2
1967	15,199	167,648	9.1	25,799	15.4
1968	14,529	171,463	8.5	39,229	22.9
1969	42,137	229,826	18.3	48,260	21.0
1970	29,208	241,116	12.1	52,470	21.8
1971	24,627	249,560	9.9	45,961	18.4
1972	29,688	313,993	9.5	72,149	23.0
1973	24,964	324,655	7.4	74,515	23.0
1974	35,650	381,215	9.4	50,807	13.3
1975	11,778	218,080	5.4	17,024	7.8
Total	255,898	2,512,099	10.2	469,549	18.7
		West less Rock Island			
1966	89,746	599,895	15.0	131,740	22.0
1967	39,637	508,987	7.8	117,903	23.2
1968	39,776	567,428	7.0	133,451	23.5
1969	66,477	566,694	11.7	135,092	23.8
1970	38,067	530,308	7.2	130,901	24.7
1971	69,640	579,710	12.0	85,854	14.8
1972	57,158	705,621	8.1	173,962	24.7
1973	64,837	722,421	9.0	168,461	23.3
1974	101,303	769,522	13.2	157,473	20.5
1975	29,391	425,804	6.9	59,562	14.0
Total	596,032	5,976,389	10.0	1,294,400	21.7

Source: R-1 Annual Reports to the Commission.

The tax rates used for forecasting purposes, developed in tables 15-1 and 15-2, are summarized in table 15-3 below:

TABLE 15-3

Tax rates used to forecast railway tax accruals and provision for deferred taxes
(Thousands of dollars)

	State tax	Current Federal tax	Deferred Federal tax
		percent	
East less bankrupts and ConRail	24.0	15.7	25.6
South	20.6	10.2	18.7
West less Rock Island	23.9	10.0	21.7

When these forecasted tax rates for State and Federal taxes are applied to forecasted levels of railway taxable income, the following tax expenses result:

TABLE 15-4

State and Federal taxes, 1976-85 (Dollars in thousands)

	East less bankrupt carriers and ConRail			South			West less Rock Island		
	State tax	Current Federal tax	Deferred Federal tax	State tax	Current Federal tax	Deferred Federal tax	State tax	Current Federal tax	Deferred Federal tax
Inflated dollar basis									
1976	54,184	26,939	43,926	34,259	13,468	24,693	216,319	68,878	149,466
1977	79,825	39,686	64,712	56,600	22,252	40,795	272,733	86,841	188,444
1978	59,192	29,428	47,985	39,143	15,389	28,213	236,064	75,165	163,108
1979	88,718	44,107	71,920	59,660	23,455	43,001	326,436	103,940	225,551
1980	145,800	72,486	118,195	104,571	41,111	75,371	480,087	152,864	331,716
1981	145,902	72,537	118,277	103,054	40,515	74,278	482,090	153,502	333,099
1982	134,287	66,763	108,862	96,355	37,881	69,449	473,051	150,624	326,855
1983	121,068	60,191	98,146	89,073	35,018	64,201	463,415	147,556	320,197
1984	81,900	40,718	66,393	48,611	19,111	35,037	433,160	137,922	299,292
1985	61,973	30,811	50,239	40,699	16,001	29,335	408,617	130,107	282,334
Constant dollar basis									
1976	50,353	25,034	40,819	27,456	10,794	19,789	190,515	60,661	131,636
1977	62,901	31,272	50,992	39,464	15,515	28,444	208,598	66,419	144,130
1978	65,398	32,513	53,016	37,216	14,631	26,824	215,508	68,620	148,905
1979	66,376	33,000	53,809	34,339	13,500	24,750	216,743	69,013	149,759
1980	74,544	37,061	60,430	37,409	14,707	26,963	224,567	71,504	155,165
1981	76,221	37,894	61,790	35,087	13,794	25,290	219,688	69,951	151,794

TABLE 15-4

State and Federal taxes, 1976-85 (Dollars in thousands)—Continued

	East less bankrupt carriers and ConRail			South			West less Rock Island		
	State tax	Current Federal tax	Deferred Federal tax	State tax	Current Federal tax	Deferred Federal tax	State tax	Current Federal tax	Deferred Federal tax
Constant dollar basis—Continued									
1982	72,398	35,994	58,691	31,050	12,207	22,380	213,572	68,003	147,568
1983	68,481	34,046	55,515	26,505	10,420	19,104	205,787	65,525	142,189
1984	44,259	22,004	35,879	1,629	640	1,174	175,461	55,868	121,235
1985	40,524	20,147	32,852	1,194	469	860	169,904	54,099	117,395

Current Federal and State taxes are combined with payroll taxes, described below, to form the account Railway Tax Accruals appearing in the projected income statements in this report.

Payroll taxes were found, through regression analysis, to be highly correlated with compensation over the 1962-75 period. However, these regressions were not used for the projections because they yielded payroll taxes which appeared much too high; that is, equivalent to about 28 percent of compensation. This was due to the extremely rapid growth in payroll taxes, from 8 percent to about 15 percent of compensation, during the period 1962-75, which was carried through in the projections.

Under existing and expected conditions, it was believed that the increase in the relative rate of growth of payroll taxes as compared with compensation could not continue. It was further believed that payroll taxes as a percentage of compensation had just about reached their maximum limit and would increase very slowly. Payroll taxes were, therefore, projected to rise gradually from about 15 to 16 percent of total compensation. The procedures set forth in Forecast Methodology No. 3, however, project compensation chargeable to freight service operating expense, not total compensation. In order to raise payroll taxes to the level consistent with total compensation—which includes amounts chargeable to passenger service operating expense and to additions and betterments—an adjustment was made. The adjustment consisted of applying the 1971-74 average ratio, for each railroad group, of total compensation to compensation chargeable to freight service operating expense (the latter estimated as described in Forecast Methodology No. 3).

Projected payroll tax dollars are shown below:

TABLE 15-5

Forecasted payroll taxes, 1976-85 (Thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
Constant dollars			
1976	$211.228	$184.555	$522,748
1977	222,975	190,808	555,660
1978	227,743	192,839	566,508
1979	232,933	195,553	575,618
1980	244,351	200.845	601,495
1981	253.513	205.307	620,406
1982	258.704	208,951	638,009
1983	263,048	212.178	656,521
1984	253,467	209,719	633,773
1985	256.685	213.738	650.580
Inflated dollars			
1976	234.848	205.191	581.201
1977	266.152	227,755	663,255
1978	314,493	266.293	782,296
1979	340.294	285,685	840,925

State and Federal taxes, 1976-85 (Dollars in thousands)—Continued

Year	East less bankrupts and ConRail	South	West less Rock Island
Inflated dollars—Continued			
1980	$378,522	$311,127	$931,771
1981	416,453	337,264	1,019,158
1982	451,321	364,525	1,113,036
1983	491,183	396,195	1,225,904
1984	501,634	415,053	1,254,294
1985	540,673	450,210	1,370,359

Forecast methodology No. 16

COMMON AND PREFERRED STOCK DIVIDENDS

Common stock dividends.—Cash dividends on common stock have been forecasted by a combination of two methods: (1) the extrapolation of historical trends in the dividend payments of entire railroad districts, and (2) the forecasting of dividend payments of eight specific roads which account for approximately 72 percent of the industry's total dividends. In forecasting the short run—i.e., 1 year out—emphasis has been placed on the second method. The financial conditions and dividend-paying capabilities of the eight prominent roads have been analyzed and subjective, but reasonably accurate, forecasts of their expected dividend payments have been prepared. To these forecasts have been added a forecast of the remaining 28 percent of the industry's expected payments, accounted for by approximately 26 other railroads which historically have paid a regular or semiregular dividend.[33]

For the short-range forecast of dividend payments by the 26 less prominent roads, and for the long range projections, covering the second to the tenth forecast year, the Coordinator has relied strictly on the extrapolation of historical dividend trends to arrive at a forecast of each district's expected dividend payment. Extrapolation of past trends was achieved by fitting a least-squares trend line to the total dividends paid in each district over the years 1969 to the first quarter of 1976. This method admittedly ignores the probability that some roads will, at times in the future, omit or hold constant their dividend payments rather than increase them gradually every year. However, the Coordinator believes such an extrapolation is superior to the popular alternative of assuming that future dividends will conform to a constant dividend payout ratio, since dividends seldom decline or rise proportionately with railroad income. This is evidenced by the fact that during the last decade, the net income of the class I railroads featured in the funds flow model has fluctuated between the extremes of $250 million to $1 billion, while common stock dividends have varied within the much narrower range of $350 to $500 million.

The 34 dividend-paying roads on which dividend forecasts are based are listed as follows:

---

[33] This does not mean that railroads excluded from the total list of 34 dividend-paying roads on page J-16-2 will not pay some dividends in the future.

East less bankrupts and ConRail	South	West less Rock Island
BLE	AWP	[1]ATSF
CEI	CCO	BN
CO[1]	ICG	CS
DTS	LN	DRGW
EJE	[1]SCL	DMIR
MI	[1]SOU	GBW
NW[1]	WRA	LSI
PLE		MNS
RFP		MP
WM		SLSF
		[1]SP
		SOO
		[1]SSW
		TP
		TPW
		[1]UP
		WP

[1]Together account for 72 percent of total dividends paid by solvent class I railroads during 1973-75.

The sources of much of the historical financial data on which dividend forecasts have been based are *Moody's Transportation Manual (1975)* and the railroads' quarterly reports ("RE&I's") to the Commission. The Commission's R-1 Annual Reports do not require the separation of dividends on common and preferred stock and historical data contained therein are, therefore, of limited value for the purpose of forecasting variable common dividends vs. relatively fixed preferred dividends.

The tables which follow show dividend payments by the eight most prominent ("major") dividend-paying roads relative to the total of all solvent class I roads during 1973-75; the Coordinator's forecast of 1976 dividend payments by those eight roads; 1976 forecasts for the remainder of the dividend-paying roads ("minor" roads); and projections of dividends for all 34 dividend-paying roads for the years 1976-85. The last two tables also include a dividend history for the period 1969-75.

TABLE 16-1

Dividend payments by eight prominent roads relative to total payments of all solvent class I railroads, 1973-75 (thousands of dollars)

	1975	1974	1973
East:			
(1) Chesapeake & Ohio Ry. Co	$39,816	$34,828	$59,435
(2) Norfolk & Western Ry. Co	51,884	52,054	51,449
(3) Total	91,700	86,882	110,884
(4) Total dividends paid by all eastern class I railroads	124,344	118,265	135,392
(5) Line (3) as percent of line (4)	73.8	73.5	81.9

Dividend payments by eight prominent roads relative to total payments of all solvent class I railroads, 1973-75 (thousands of dollars)—Continued

	1975	1974	1973
South:			
(6) Seaboard Coastline RR Co	$23,669	$25,120	$15,598
(7) Southern Ry	30,767	29,175	25,440
(8) Total	54,436	54,295	41,038
(9) Total dividends paid by all southern class I railroads	76,783	83,553	68,509
(10) Line (8) as percent of line (9)	70.9	65.0	59.9
West:			
(11) Atchison, Topeka & Santa Fe Ry	27,000	36,000	36,000
(12) St. Louis Southwestern Ry. Co	34,362	38,658	12,886
(13) Southern Pacific Transportation Co	15,199	59,710	58,968
(14) Union Pacific RR Co	62,801	58,998	22,429
(15) Total	139,362	193,366	130,283
(16) Total dividends paid by all western class I railroads	197,604	251,926	193,190
(17) Line (15) as percent of line (16)	70.5	76.8	67.4
All Districts:			
(18) Total of lines (3), (8), and (15)	285,498	334,543	282,205
(19) Total of lines (4), (9), and (16)	398,731	453,744	397,091
(20) Line (18) as percent of line (19)	71.6	73.7	71.1
(21) Total 1973-75 dividends, line (18)		902,246	
(22) Total 1973-75 dividends, line (19)		1,249,566	
(23) Line (21) as percent of line (22)		72.2	

TABLE 16-2

Forecast of 1976 dividends expected to be paid by eight major roads (thousands of dollars)

Railroad	CY 1976 dividend forecast	1st Q 1976 actual dividend	CY 1975 actual dividend
East:			
Chesapeake & Ohio Ry. Co	$40,000	$9,856	$39,816
Norfolk & Western Ry. Co	53,000	12,979	51,884
Subtotal	93,000	22,835	91,700
South:			
Seaboard Coastline RR Co	21,000	5,165	23,669
Southern Ry	31,000	7,713	30,767
Subtotal	52,000	12,878	54,436
West:			
Atchison, Topeka & Santa Fe Ry. Co	27,000		27,000
St. Louis Southwestern Ry. Co	38,000		34,362
Southern Pacific Transportation Co	60,000	15,199	15,199
Union Pacific RR Co	67,000	15,700	62,801
Subtotal	192,000	30,899	139,362
Total	337,000	66,612	285,498

TABLE 16-3

Forecast of 1976 dividends expected to be paid by 26 minor roads (thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
1969	$18,124	$24,249	[1]$84,200
1970	20,934	25,367	72,010
1971	12,869	25,197	50,325
1972	19,247	25,485	49,741
1973	24,148	27,471	59,945
1974	30,695	29,258	58,560
1975	32,364	22,347	58,242
1976 forecast	33,129	26,246	[2]58,242

[1] Includes $34,434 for the Burlington Northern which is actually the combined 1969 dividend of the Great Northern Ry. Co., the Northern Pacific Ry. Co., and the Chicago Burlington & Quincy RR Co., which merged to form the Burlington Northern in 1970.

[2] The combined dividends of the minor Western roads have actually trended downward since 1969, but in light of their stability over the 1973-75 period and the favorable outlook for business profits this year, dividends have been conservatively forecast as remaining stable through 1976.

TABLE 16-4

Projection of dividends to be paid by 34 major and minor roads over 1976-85 (thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
1969	$109,005	$64,715	$223,445
1970	109,404	67,723	233,612
1971	88,269	75,078	209,209
1972	94,197	80,147	195,378
1973	135,032	68,509	190,228
1974	117,577	83,553	251,926
1975	124,064	76,783	197,604
1976 forecast	126,129	78,246	250,242
1977 forecast	130,206	82,584	225,949
1978 forecast	134,038	84,415	227,503
1979 forecast	137,871	86,246	229,057
1980 forecast	141,704	88,077	230,611
1981 forecast	145,536	89,910	232,165
1982 forecast	149,368	91,739	233,719
1983 forecast	153,200	93,569	235,273
1984 forecast	157,033	95,401	236,827
1985 forecast	160,865	97,232	238,381

Note: The 1976 forecast is the total of the 1976 forecasts for major and minor roads, respectively, shown in tables 16-2 and 16-3. The forecasts for years 1977-85 are continuations of the trends established in each district during the 1969-76 period.

Preferred stock dividends.—Solvent class I railroads have been redeeming their preferred stock issues over the last decade, as the following table shows:

TABLE 16-5

Preferred stock outstanding (thousands of dollars)

Yearend	East less bankrupts and ConRail	South	West less Rock Island
1975	$79,891	$82,599	$337,486
1974	79,583	84,401	377,135
1973	79,583	92,672	226,016
1972	104,592	92,671	226,353
1971	104,592	98,974	328,009
1970	104,592	89,720	327,885
1969	104,611	92,190	414,069
1968	104,612	92,390	419,383
1967	104,626	91,902	423,338
1966	104,659	92,156	539,794

Source: R-1 Annual Reports to the Commission.

As of yearend 1975, only 17 roads had preferred stock outstanding:

TABLE 16-6

(Thousands of dollars)

	Preferred stock outstanding	1975 dividends
East:		
BO	$60,000	
BLE	11,999	$420
MEC	798	39
PRSL	1,000	
WM	5,594	284
	79,391	743
South:		
GSF	559	
AGS	3,380	203
SOU	78,660	4,038
	82,599	4,241
West:		
BN	30,339	1,687
MILW	51,865	
CS	17,000	680
GBW	7,600	
KCS	21,000	
MP	114,358	6,237
OE	580	
SSW	19,884	994
UP	74,860	2,994
	337,486	12,592
Total	499,476	17,576

Source: *Moody's* and quarterly reports to the Commission. 1975 dividend data not available for GSF and AGS. GSF assumed to have paid no dividends as in 1975; AGS dividends estimated at 6 percent of outstanding preferred as specified in its annual report.

Of these 18 roads, 11 have paid regular dividends during the 1969-75 period (as required by their specific preferred stock agreements), and have been forecast to do so in the future at rates equal to those paid in 1975. Inherent in this forecast of preferred stock dividends is the assumption that the railroads will not increase their use of preferred stock capital over the next decade, since the recent trend towards use of this capital source has been a declining one. If future developments—for example, a more favorable tax treatment of preferred stock dividends or U.S. Government purchases of railroad preferred stock—come about, then this trend may, of course, reverse itself.

The following table combines the above forecasts of both common and preferred stock dividends:

TABLE 16-7

Total common and preferred stock dividends to be paid by class I railroads over 1976-85 (thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
1976	$126,872	$82,487	$262,834
1977	130,949	86,825	238,541
1978	134,781	88,656	240,095
1979	138,614	90,487	241,649
1980	142,447	92,318	243,203
1981	146,279	94,151	244,757
1982	150,111	95,980	246,311
1983	153,943	97,810	247,865
1984	157,776	99,642	249,419
1985	161,608	101,473	250,973

Forecast Methodology No. 17

MINOR ACCOUNTS[16]

Historical trends in the following "minor accounts" have been studied for methods of forecasting each account:

(1) Other Income
(2) Miscellaneous Deductions
(3) Extraordinary and Prior Period Items
(4) Special Funds
(5) Investment in Securities
(6) Miscellaneous Property
(7) Other Assets and Deferred Charges
(8) Reserves
(9) Other Liabilities and Deferred Credits
(10) Capital Stock
(11) Capital Surplus

The balances of most of these accounts characteristically change at the discretion of management and are, therefore, difficult to project. Forecasts must often be based on long-run historical trends, rather than more fundamental economic assumptions about the future. In order to forecast each account, the following possibilities were considered: (1) extrapolating the historical trend by fitting a line to the historical data points; (2) using an average or median of the historical data; (3) maintaining a constant percentage relationship between the subject account and related accounts; (4) using the 1975 value in each of the forecast years; or (5) some other methodology. It appears that the most appropriate alternative has been chosen for each account.

---

[16] By "minor account" it is meant that these account balances are either a relatively small percentage of total assets, total liabilities, stockholders' equity, total revenues, or they change unpredictably at the discretion of railroad management. While the methods used to project these accounts are perhaps less rigorous than those developed for the "major" accounts, the impact on the accuracy of the total forecast should, accordingly, be a minor one.

Only one forecast has been made for each minor account, that forecast satisfying both the current dollar and constant dollar scenarios. In general, current dollar forecasts differ from constant dollar forecasts by showing future increments to a base year balance sheet account, or future income and expense items, at levels reflecting assumptions as to future rates of price level growth. A forecast of equipment expenditures, for example, begins with a unit forecast to which various forecasted price levels are applied, either base year prices or forecasted inflated prices. Most of the minor accounts, however, cannot be segregated into units and prices, as such; they are describable only as dollar amounts. They have been forecasted after analysis of their historical trends, which are trends of dollar balances reflecting past rates of inflation. Consequently, the constant dollar forecasts may be slightly overstated. Subsequently analyses of these account trends will be performed on both a deflated and inflated basis to better adapt resulting forecasts to both current and constant dollar assumptions. A discussion of the forecast methodology for each minor account follows.

(1) *Other Income;* and (2) *Miscellaneous Deductions.*—Other Income and Miscellaneous Deductions have been forecast in relation to the combined projections of Miscellaneous Property and Investments in Securities, the two asset accounts which produce most of the credits comprising the Other Income and debits comprising the Miscellaneous Deductions accounts.

These account relationships were analyzed for 1974 and 1975 only, due to an ICC accounting rule change instituted in 1974 which allowed the railroads to implement the "equity" (as opposed to "cost") system of accounting for certain investments. The subject accounts thus exhibited the following relationships in 1974 and 1975:

TABLE 17-1

(Thousands of dollars)

	East less bankrupts and ConRail	South	West less Rock Island
(1) Miscellaneous property, 12/31/74	$63,072	$76,494	$217,092
(2) Miscellaneous property, 12/31/75	65,813	81,288	235,797
(3) Average of (1) and (2)	64,443	78,891	226,445
(4) Investment in securities, 12/31/74	973,232	1,083,594	1,356,225
(5) Investment in securities, 12/31/75	975,415	1,136,065	1,387,416
(6) Average of (4) and (5)	974,324	1,109,830	1,371,821
(7) Total of (3) and (6)	1,038,767	1,188,721	1,598,266
(8) Other income, 1/1/75-12/31/75	123,453	149,052	268,713
(9) Less: undistributed earnings, 1/1/75-12/31/75	27,955	34,450	9,528
(10) Total	95,498	114,602	259,185
(11) (10) as percent of (7)	9.2	9.6	16.2
(12) Miscellaneous deductions, 1/1/75-12/31/75	8,482	18,944	44,039
(13) (12) as percent of (7)	0.8	1.6	2.8

Source: R-1 Annual Reports to the Commission.

The 9.2-percent, 9.6-percent, and 16.2-percent factors have been applied to forecasts of Miscellaneous Property and Investments in Securities to derive a portion of forecasted Other Income. The remaining portion of the Other Income forecast is the Undistributed Earnings of Affiliates, held constant at 1975 levels throughout the forecast period. (See item (5)—Investments in Securities and Item (6)—Miscellaneous Property.)

The 0.8-percent, 1.6-percent, and 2.8-percent factors have been applied to the same forecasts to derive Miscellaneous Deductions. The Other Income and Miscellaneous Deductions forecasts are shown below:

TABLE 17-2

Forecasted other income account

(THOUSANDS OF DOLLARS)

Year	East less bankrupts and ConRail	South	West less Rock Island
1976	$123,733	$151,294	$277,289
1977	126,306	154,651	277,604
1978	128,879	158,008	277,919
1979	131,453	161,365	278,234
1980	134,026	164,722	278,549
1981	136,599	168,079	278,864
1982	139,172	171,436	279,179
1983	141,745	174,793	279,494
1984	144,318	178,150	279,809
1985	146,891	181,507	280,124

A more accurate forecast of other income might be achieved in the future by analyzing more thoroughly specific investments producing dividend and interest income, which together account for a large portion of other income. Below is the table showing forecasted miscellaneous deductions:

TABLE 17-3

Forecasted miscellaneous deductions account

(THOUSANDS OF DOLLARS)

Year	East less bankrupts and ConRail	South	West less Rock Island
1976	$8,552	$20,025	$46,547
1977	8,776	20,585	46,601
1978	9,000	21,144	46,655
1979	9,224	21,704	46,709
1980	9,448	22,263	46,763
1981	9,672	22,823	46,817
1982	9,896	23,382	46,871
1983	10,120	23,942	46,925
1984	10,344	24,501	46,979
1985	10,568	25,061	47,033

(3) *Extraordinary and Prior Period Items.*—This account, first recorded by the railroads in 1967, fluctuates considerably from year to year. Because it consists of the gains and losses on the sale of properties and securities, as well as the effects of approved accounting adjustments, it is just as likely to show an extreme positive balance as it is an extreme negative balance. Following is a history of this account, by district:

TABLE 17-4

Year	East less bankrupts and ConRail	South	West less Rock Island
	(Thousands of dollars)		
1967	$1,547	$4,771	$33,108
1968	938	2,288	1,579
1969	(13,569)	(1,191)	(27,138)
1970	(22,586)	0	(16,080)
1971	(76,439)	(60,938)	(269,077)
1972	(71,020)	228	5,686
1973	8,822	0	3,904
1974	23,563	12,318	(95)
1975	1,354	13,574	3,750
Average	(16,377)	(3,216)	(29,374)

Source: R-1 Annual Reports to the Commission.

Because there does not appear to be any logical basis for the forecasting of this account, its balance has been forecast at a zero value from 1976-85.

(4) *Special Funds.*—This account is composed of three subaccounts: Sinking Funds, Capital and Other Reserve Funds, and Insurance and Other Funds, which were analyzed separately. These subaccounts show the following historical trends:

TABLE 17-5

(Thousands of dollars)

Year	Sinking fund	Capital funds, et cetera	Insurance funds, et cetera
	District: East less bankrupts and ConRail		
1966	$1,269	$27,134	$4,943
1967	1,913	22,207	5,022
1968	735	5,041	5,454
1969	198	18,795	6,392
1970	265	21,824	6,809
1971	306	12,195	7,435
1972	200	12,929	7,384
1973	309	15,994	7,529
1974	455	40,239	7,672
1975	562	52,046	8,744

(Thousands of dollars)

Year	Sinking fund	Capital funds, et cetera	Insurance funds, et cetera
	District: South		
1966	$1,414	$32,223	$2,739
1967	1,615	9,955	3,092
1968	1,617	47,336	3,598
1969	1,507	16,118	6,354
1970	1,630	15,806	4,465
1971	1,634	10,854	4,330
1972	1,479	46,639	4,612
1973	1,516	33,346	4,499
1974	1,657	44,064	5,241
1975	1,533	39,780	5,419
	District: West less Rock Island		
1966	25,200	63,589	7,960
1967	28,708	21,441	8,857
1968	31,680	49,211	7,904
1969	35,669	26,104	11,886
1970	38,171	55,503	19,668
1971	40,318	77,507	21,315
1972	41,644	102,195	27,282
1973	41,794	75,093	19,019
1974	44,890	128,791	21,846
1975	46,869	106,364	14,776

Source: R-1 Annual Reports to the Commission.

Sinking Funds.—The above figures show that the balance of this account has fluctuated in the East, remained relatively stable in the South, and risen consistently in the West. There are a multitude of variables which determine the movement in this account, however, and which make it difficult to forecast.

First, the overall level of class I railroad funded (nonequipment) debt has declined over the 10-year period 1966-75, from approximately $5.7 billion to $3.7 billion. This should influence the sinking fund balance negatively. Secondly, the credit ratings of the railroads, as a whole, have probably declined somewhat. This is evidenced by the virtual absence of any AAA—rated railroad bonds in today's resale market. This decline in credit ratings would be expected to cause bondholders to seek sinking fund agreements in a larger number of new bond indentures, thereby causing the level of sinking fund balances to rise. Thirdly, interest rates on bonds have risen historically, causing bond prices to drop in the secondary market. Railroads with bond indentures which allow the purchase of outstanding bonds at market prices to satisfy sinking fund requirements would tend to take advantage of the lower bond prices. This tendency could be reflected in roads repurchasing bonds in a volume designed to meet sinking fund requirements for more than one period, thereby depressing the level of sinking funds once the repurchased bonds are cancelled.

It appears that the declining funded debt balances is the overriding factor in the forecast decision. While sinking fund levels, on the whole, may appear to have risen since 1966, they may eventually be expected to fall if the railroads continue to issue fewer and fewer bonds. A prudent forecast methodology would then be to hold sinking funds constant at their 1975 levels over the forecast period.

Capital and Other Reserve Funds.—These funds, representing temporarily idle funds realized from the sale of securities or properties, follow no particular historical trend in any district. This account has therefore been forecast as an average of its 1965-74 levels: $22,840,400 in the East, $29,612,100 in the South, and $70,579,800 in the West.

Insurance and Other Funds.—These funds, which include assets held for a variety of purposes, such as insurance, employee's pensions, and hospital funds, show a clearly upward trend from 1966-75. Because the account includes diverse components, and would be difficult to key to any other single variable, it has been forecast on the basis of its historical trend, as follows:

TABLE 17-6

(Thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
1976	$8,963	$5,712	$24,573
1977	9,367	5,944	26,122
1978	9,772	6,176	27,671
1979	10,176	6,408	29,221
1980	10,581	6,640	30,770
1981	10,985	6,873	32,320
1982	11,390	7,105	33,869
1983	11,794	7,337	35,418
1984	12,199	7,569	36,968
1985	12,603	7,801	38,517

The three separate methodologies for Sinking Funds, Capital and Other Reserve Funds, and Insurance and Other Reserve Funds combine to produce the following forecasts for the main account, Special Funds:

TABLE 17-7

(Thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
1976	$32,365	$36,857	$142,022
1977	32,769	37,089	143,571
1978	33,174	37,321	145,120
1979	33,578	37,553	146,670
1980	33,983	37,785	148,219

TABLE 17-7—Continued

Year	East less bankrupts and ConRail	South	West less Rock Island
1981	$34,387	$38,018	$149,769
1982	34,792	38,250	151,318
1983	35,196	38,482	152,867
1984	35,601	38,714	154,417
1985	36,006	38,946	155,966

(5) *Investment in Securities.*—Due to a change by the ICC to the "equity" basis of accounting for certain investments, this account was "written up" in 1974, leaving little history for the account on a comparable accounting basis. Selected financial data related to this account are shown below:

TABLE 17-8

(Thousands of dollars)

	East less bankrupts and ConRail	South	West less Rock Island	All districts combined
Total yearend 1974 investment in securities	$973,232	$1,083,594	$1,365,225	$3,422,051
1975 undistributed earnings of affiliates	27,955	34,450	9,528	71,933
Total	1,001,187	1,118,044	1,374,753	3,493,984
Total yearend 1975 investment in securities	975,415	1,136,065	1,387,416	3,498,896
Difference	(25,772)	18,021	12,663	4,912

SOURCE: R-1 Annual Reports to the Commission, schedules 200 and 300.

From these data it can be seen that, on the basis of the three districts combined, the yearend 1975 Investment in Securities account balance was close to the yearend 1974 balance plus the income account (1975)—Undistributed Earnings. For this reason, it was decided to hold constant the yearend 1975 balance of the Investment in Securities account over the forecast period, adding to it each year, in a cumulative fashion, the Undistributed Earnings recorded in 1975. On this basis, Investment in Securities has been forecast as follows:

TABLE 17-9

(Thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
1976	$1,003,370	$1,170,515	$1,396,944
1977	1,031,325	1,204,965	1,406,472
1978	1,059,280	1,239,415	1,416,000
1979	1,087,235	1,273,865	1,425,528
1980	1,115,190	1,308,315	1,435,056
1981	1,143,145	1,342,765	1,444,584
1982	1,171,100	1,377,215	1,454,112
1983	1,199,055	1,411,665	1,463,640
1984	1,227,010	1,446,115	1,473,168
1985	1,254,965	1,480,565	1,482,696

(6) *Miscellaneous Property.*—Ten-year trends towards the accumulation of Miscellaneous Property have slowed in the East, continued in the South, and reversed in the West. All three districts showed a net divestiture of such property at some point in the 1970's, presumably for purposes of securing needed funds during periods of monetary restrictiveness and high interest rates. And though the West shows the greatest decline in these properties, its balance increased in 1975 over 1974, along with those of the other districts:

TABLE 17-10

(Thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
1966	$62,775	$75,412	$253,517
1967	66,249	76,693	308,593
1968	66,979	75,732	342,772
1969	65,682	78,066	373,381
1970	65,758	77,283	413,695
1971	67,365	80,259	305,469
1972	66,641	80,566	307,544
1973	65,491	80,410	313,619
1974	63,072	76,494	217,092
1975	65,813	81,288	235,797

SOURCE: R-1 Annual Reports to the Commission.

The forecasts below assume a continuation of the long-term decline in Miscellaneous Property in the West (notwithstanding 1975), continued increases in the South, and slight gains in the East. It may be that a more prosperous economy in the latter '70's will cause the investment trend in the East to accelerate, and in the West to return upward, a phenomenon which would be incorporated into future forecast.

TABLE 17-11

(Thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
1976	$65,654	$81,065	$265,432
1977	65,667	81,583	257,847
1978	65,680	82,100	250,262
1979	65,693	82,618	242,677
1980	65,706	83,135	235,093
1981	65,719	83,652	227,507
1982	65,732	84,169	219,923
1983	65,745	84,687	212,338
1984	65,758	85,204	204,753
1985	65,771	85,721	197,169

(7) *Other Assets and Deferred Charges;* (8) *Reserves.*—These accounts have exhibited rising trends in the three districts over the last decade despite the inclusion in each of numerous, unrelated items. These trends are shown below:

TABLE 17-12

(Thousands of dollars)

Year	East less bankrupts and ConRail		South		West less Rock Island	
	Other Assets	Reserves	Other Assets	Reserves	Other Assets	Reserves
1966	$47,413	$75,283	$42,940	$27,361	$99,337	$97,500
1967	49,255	71,776	46,585	27,393	105,863	109,673
1968	51,812	79,594	44,827	31,031	106,826	109,665
1969	56,664	75,733	52,517	78,205	133,251	122,691
1970	53,504	75,109	55,407	76,812	148,619	149,747
1971	61,914	101,058	61,609	72,457	201,556	259,484
1972	65,692	108,324	109,393	83,169	204,528	239,074
1973	84,036	123,234	103,993	67,569	185,700	250,469
1974	62,510	147,462	89,241	56,337	147,237	258,409
1975	66,459	176,605	90,892	54,116	155,198	233,788

SOURCE: R-1 Annual Reports to the Commission.

Assuming these trends will continue throughout the forecast period, they have been extrapolated linearly as follows:

TABLE 17-13

(Thousands of dollars)

Year	East less bankrupts and ConRail		South		West less Rock Island	
	Other assets	Reserves	Other assets	Reserves	Other assets	Reserves
1976	$75,286	$162,872	$109,834	$78,666	$197,262	$297,405
1977	78,079	173,682	117,124	82,524	206,071	318,197
1978	80,872	184,492	124,414	86,383	214,880	338,989
1979	83,665	195,301	131,704	90,241	223,689	359,780
1980	86,458	206,111	138,994	94,099	232,498	380,572
1981	89,250	216,921	146,283	97,958	241,307	401,364
1982	92,043	227,731	153,573	101,816	250,116	422,156
1983	94,836	238,541	160,863	105,675	258,925	442,948
1984	97,629	249,351	168,153	109,533	267,735	463,740
1985	100,422	260,160	175,443	113,391	276,544	484,531

(9) *Other Liabilities and Deferred Credits.*—This account contains a substantial element in 1974 and 1975 not found in prior years—deferred tax credits—due to the Commission's recognition of deferred tax accounting in those years:

TABLE 17-14

(Thousands of dollars)

Year	East less bankrupts and ConRail	South	West less Rock Island
1966	$218,713	$72,214	$157,933
1967	229,135	71,047	163,998
1968	234,412	71,275	160,465
1969	228,492	80,541	186,512
1970	220,472	95,216	203,513
1971	232,882	120,268	232,370
1972	246,466	123,402	211,263
1973	271,761	115,127	225,228
1974	1,018,018	698,242	1,938,351
1975	1,015,026	688,065	2,016,623

SOURCE: R-1 Annual Reports to the Commission.

Other Liabilities and Deferred Credits has been held constant in each forecast year at the 1975 level, by district. In the future, it is anticipated that the forecasting of this account will be coordinated with the forecast methodology for deferred income taxes, in order to estimate year to year increases.

(10) *Capital Stock*; (11) *Capital Surplus*. As shown below, the railroads' Capital Stock accounts declined over the past decade, while their Capital Surplus accounts rose slowly until 1970 or 1971 when they abruptly increased in each district:

TABLE 17-15

(Thousands of dollars)

Year	East less bankrupts and ConRail		South		West less Rock Island	
	Capital stock	Capital surplus	Capital stock	Capital surplus	Capital stock	Capital surplus
1966	$1,118,348	$107,117	$833,268	$165,780	$2,613,468	$352,440
1967	1,133,747	104,371	814,227	187,787	2,930,397	383,607
1968	1,204,882	176,728	817,333	191,284	2,983,113	361,293
1969	1,169,689	176,100	835,540	206,597	2,984,767	366,052
1970	1,190,050	348,988	847,887	228,576	2,721,503	492,545
1971	1,188,051	436,814	825,825	433,279	2,672,372	486,481
1972	1,186,060	512,725	630,910	642,772	2,388,179	463,286
1973	1,126,340	640,196	631,417	643,238	2,387,925	463,327
1974	1,123,139	738,769	628,841	684,706	2,387,383	469,746
1975	1,034,116	870,856	627,529	687,020	2,390,736	468,957

SOURCE: R-1 Annual Reports to the Commission.

The offsetting movements in the Capital Stock and Capital Surplus accounts, particularly in 1970 and 1971, suggest that there has been some merger activity among the railroads over the past decade which has been effected by means of exchanges of stock. The total of the two accounts for all districts has risen only 5 percent during the 1970's, however, which leads to the conclusion that while these capital components may be shifting, there is no appreciable amount of new outside equity entering the industry. Since further shifts between the two accounts would be difficult to predict, and because it is being assumed that no new equity issues will be offered publicly, Capital Stock and Capital Surplus have both been held constant at their respective 1975 levels throughout the forecast period.

Forecast Methodology No. 18

NET INVESTMENT BASE PROJECTED

The net investment base includes cash; materials and supplies; transportation property, less "other elements of investment" and less "construction work in progress;" and lessor property.

Cash, materials, and supplies.—The total of cash, materials, and supplies constitutes the working capital allowance included in the rate base. The allowance was determined as the lesser of (1) ~~the~~ projected cash balance in the pro forma balance sheet, and (2) 15 days of cash operating expenses (operating expenses minus depreciation and property retirements plus rent and tax payments). The Bureau of Accounts, Section of Cost and Valuation, has been using 15 days of cash operating expenses as a "buffer fund allowance" in its formula to compute working capital allowance. Based on the formula, as applied to individual carriers, the buffer fund will either be reduced by an amount of "anticipated payments" or increased by an amount of "delayed payments." A 15-day buffer period has been used for two reasons: (1) the "anticipated payments" and "delayed payments" are not susceptible to a reasonable forecast on a district basis; (2) the anticipated and delayed payments of carriers within each district tend to offset each other leaving the 15-day buffer period as a midpoint which is believed to reflect the intent of the formula.

Transportation property.—Transportation property is derived from line 6 of the projected balance sheet statement. These projections are shown in the attachment to this methodology. Projections for other elements of investment and construction work in progress are subtracted from transportation property since the accounts are not included in the net investment base.

Other elements of investment.—In an order in No. 32153 served in April 1963, the Commission required the railroads to bring the book values of their properties into line with their valuation. The difference between the two, either credit or debit was entered into "Other Elements of Investment" (Account 80). The railroads, with the exception of Southern Pacific, agreed to writeoff account 80, over a certain period of time, as property that is retired. By definition, account 80 is always declining.

The history of account 80 for the years 1969 through 1975 is shown below:

TABLE 18-1

Account 80—Other Elements of Investment Actual Historical Data, 1969-1975
(Dollars in thousands)

	Eastern district less bankrupts and ConRail	Western district less Rock Island	Southern district
1969	$59,825	$45,584	$13,466
1970	62,901	56,402	10,946
1971	64,838	51,371	35,503
1972	64,651	216,133	35,927
1973	64,667	212,482	35,999
1974	64,553	207,105	38,169
1975	64,389	205,244	36,212

The large increase in account 80 which occurred in the Western district in 1972 can be attributed to the Chicago and North Western Railroad, which changed ownership. Its credit balance of $174 million was then canceled out.

For the eastern and southern districts, this account will be held constant during the forecast period. The western district less the Rock Island will continue to decrease.

With respect to the U.S. total, it is estimated that in 10 years "Other Elements of Investment" will decrease approximately 20 percent from the base year level. A 2-percent decline per year appears reasonable since the trend of the last 4 years indicates about a 2-percent decrease each year.

The projections of "Other Elements of Investment" appear in the attachment to this methodology.

Construction work in progress.—Tabulated below are historical data for Account 90, Construction Work in Progress.

TABLE 18-2

Account 90—Construction Work in Progress (Dollars in thousands)

	Eastern district less bankrupts and ConRail	Western district less Rock Island	Southern district
1969	$44,126	$82,427	$41,391
1970	29,348	81,196	34,549
1971	43,199	57,237	26,299
1972	43,407	84,648	28,476
1973	31,201	125,800	41,531
1974	29,925	173,311	80,375
1975	49,191	158,820	88,481

The balances reported in this account depend entirely on what the railroads are spending on construction. While it is recognized that balances in the West and South have shown considerable growth over the past 5 years, all balances are being held constant at 1975 levels for projection purposes.

Lessor properties.—The final component for the net investment base is lessor properties. The table below presents net book value of lessor properties for all regions during the years 1972-75:

TABLE 18-3

Net book value of lessor properties (Thousands of dollars)

	Eastern district less bankrupts and ConRail	South	West
1972	$778,105	$352,422	$870,572
1973	797,839	356,368	816,552
1974	781,050	362,599	819,171
1975	801,487	400,089	842,143

The above figures were obtained from schedules 211 N-1 and N-2 of the annual reports filed with the ICC by the class I railroads. For the purposes of projecting the net investment base, the net book value of lessor properties, due to the relative constancy over 1972-75, is being held constant across the forecast horizon at the 1975 yearend level.

The following attachment combines the projections for all of the aforementioned accounts to derive projections of the net investment base over the 1976-85 period on both a constant and inflated-dollar basis.

Table 18-4

Attachment to Forecast Methodology No. 18 projection of net investment base

CONSTANT DOLLAR BASIS

Projected data for forecast years (in 000's)

Line	Investment base components and adjustments	Source reference	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	Class I railroads—All districts, excluding bankrupt carriers and ConRail											
1	Cash	FM-18	$581,370	$616,245	$628,110	$640,530	$672,075	$696,690	$716,955	$737,235	$713,565	$734,010
2	Materials and supplies	FM-18	773,541	831,854	859,405	886,831	939,241	982,879	1,022,694	1,063,358	1,041,549	1,081,504
3	Transportation property (line 6 projected balance sheet)	Sch. 1-A(C)	24,927,987	26,694,769	27,659,314	29,015,576	31,070,097	32,942,271	34,440,019	35,716,233	36,214,436	37,526,874
4	Other elements of investment (account 80)	FM-18	301,740	297,717	293,774	289,910	286,123	282,412	278,775	275,211	271,718	268,295
5	Construction in progress (account 90)	FM-18	296,492	296,492	296,492	296,492	296,492	296,492	296,492	296,492	296,492	296,492
6	Transportation property less account 80 and account 90	L. 3-4-5	24,329,755	26,100,560	27,069,048	28,429,174	30,487,482	32,363,367	33,864,752	35,144,530	35,646,226	36,962,087
7	Lessor property	FM-18	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719
8	Net investment base (end of year)	L. 1,2,6,7	27,728,385	29,592,378	30,600,282	32,000,254	34,142,517	36,086,655	37,648,120	38,988,842	39,445,059	40,821,320
9	Net investment base (average of beginning and end of year)		26,412,988	28,660,381	30,096,330	31,300,268	33,071,385	35,114,586	36,867,387	38,318,481	39,216,950	40,133,189
	Eastern district (excluding bankrupts)											
10	Cash	FM-18	127,425	134,085	136,275	138,885	145,470	150,495	152,955	154,860	148,380	149,775
11	Materials and supplies	FM-18	147,182	154,032	156,779	160,010	166,474	171,775	174,895	177,583	172,567	174,755
12	Transportation property (line 6 projected balance sheet)	Sch. 2-A(C)	5,085,313	5,312,666	5,424,470	5,596,678	5,884,769	6,126,478	6,285,689	6,388,240	6,381,035	6,469,517
13	Other elements of investment (account 80)	FM-18	64,389	64,389	64,389	64,389	64,389	64,389	64,389	64,389	64,389	64,389
14	Construction in progress (account 90)	FM-18	49,191	49,191	49,191	49,191	49,191	49,191	49,191	49,191	49,191	49,191
15	Transportation property less account 80 and account 90	L. 12-13-14	4,971,733	5,199,086	5,310,890	5,483,098	5,771,189	6,012,898	6,172,109	6,274,660	6,267,455	6,355,937
16	Lessor property	FM-18	801,487	801,487	801,487	801,487	801,487	801,487	801,487	801,487	801,487	801,487
17	Net investment base (end of year)	L. 10,11,15,16	6,047,827	6,288,690	6,405,431	6,583,480	6,884,620	7,136,655	7,301,446	7,408,590	7,389,889	7,481,954
18	Net investment base (average of beginning and end of year)		5,893,367	6,168,258	6,347,060	6,494,455	6,734,050	7,010,637	7,219,050	7,355,018	7,399,239	7,435,921
	Southern district											
19	Cash	FM-18	120,495	125,850	126,870	128,640	133,350	137,130	139,920	142,275	138,405	141,720
20	Materials and supplies	FM-18	144,724	152,765	155,627	159,267	166,179	172,065	176,887	181,141	177,744	182,945
21	Transportation property (line 6 projected balance sheet)	Sch. 3-A(C)	5,936,254	6,428,856	6,719,997	7,149,886	7,788,636	8,368,862	8,834,083	9,216,173	9,382,253	9,797,164
22	Other elements of investment (account 80)	FM-18	36,212	36,212	36,212	36,212	36,212	36,212	36,212	36,212	36,212	36,212
23	Construction in progress (account 90)	FM-18	88,481	88,481	88,481	88,481	88,481	88,481	88,481	88,481	88,481	88,481
24	Transportation property less account 80 and account 90	L. 19,20,24,25	5,811,561	6,304,163	6,595,304	7,025,193	7,663,943	8,244,169	8,709,390	9,091,480	9,257,560	9,672,471
25	Lessor property	FM-18	400,089	400,089	400,089	400,089	400,089	400,089	400,089	400,089	400,089	400,089
26	Net investment base (end of year)	L. 19,20,24,25	6,476,869	6,982,867	7,277,890	7,713,189	8,363,561	8,953,453	9,426,286	9,814,985	9,973,798	10,397,225
27	Net investment base (average of beginning and end of year)		5,798,733	6,729,868	7,130,378	7,495,539	8,038,375	8,658,507	9,189,869	9,620,635	9,894,391	10,185,511
	Western district (excluding Rock Island Railroad)											
28	Cash	FM-18	333,450	356,310	364,965	373,005	393,255	409,065	424,080	440,100	426,780	442,515
29	Materials and supplies	FM-18	481,635	525,057	546,999	567,554	606,588	639,039	670,912	704,634	691,236	723,804
30	Transportation property (line 6 projected balance sheet)	Sch. 4-A(C)	13,906,420	14,953,247	15,514,847	16,269,012	17,396,692	18,446,931	19,320,247	20,111,820	20,451,148	21,260,193
31	Other elements of investment (account 80)	FM-18	201,139	197,116	193,173	189,309	185,522	181,811	178,174	174,610	171,117	167,694
32	Construction in progress (account 90)	FM-18	158,820	158,820	158,820	158,820	158,820	158,820	158,820	158,820	158,820	158,820
33	Transportation property less account 80 and account 90	L. 30-31-32	13,546,461	14,597,311	15,162,854	15,920,883	17,052,350	18,106,300	18,983,253	19,778,390	20,121,211	20,933,679
34	Lessor property	FM-18	842,143	842,143	842,143	842,143	842,143	842,143	842,143	842,143	842,143	842,143
35	Net investment base (end of year)	L. 28,29,33,34	15,203,689	16,320,821	16,916,961	17,703,585	18,894,336	19,996,547	20,920,388	21,765,267	22,081,372	22,942,141
36	Net investment base (average of beginning and end of year)		14,506,368	15,762,255	16,618,891	17,310,273	18,298,960	19,445,441	20,458,467	21,342,827	21,923,319	22,511,756

Table 18-4—Continued

Attachment to Forecast Methodology No. 18 projection of net investment base—Continued

INFLATED DOLLAR BASIS

Projected data for forecast years (in 000's)

Line	Investment base components and adjustments	Source reference	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	Class I railroads—All districts, excluding bankrupt carriers and ConRail											
1	Cash	FM-18	$641,565	$739,365	$832,740	$906,930	$1,016,940	$1,111,170	$1,205,760	$1,311,465	$1,340,460	$1,457,760
2	Materials and supplies	FM-18	844,170	973,955	1,057,925	1,138,678	1,256,312	1,372,323	1,499,506	1,629,304	1,672,497	1,830,551
3	Transportation property (line 6 projected balance sheet)	Sch. 1-A(I)	25,168,898	27,370,172	28,744,029	30,729,595	33,806,900	36,823,044	39,502,137	42,020,448	43,406,205	46,442,398
4	Other elements of investment (account 80)	FM-18	301,740	297,717	293,774	289,910	286,125	282,412	278,775	275,211	271,718	268,295
5	Construction in progress (account 90)	FM-18	296,492	296,492	296,492	296,492	296,492	296,492	296,492	296,492	296,492	296,492
6	Transportation property less account 80 and account 90	L. 3-4-5	24,570,666	26,775,963	28,153,763	30,143,193	33,224,285	36,244,140	38,926,870	41,448,745	42,837,995	45,877,611
7	Lessor property	FM-18	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719	2,043,719
8	Net investment base (end of year)	L. 1,2,6,7	28,100,120	30,533,002	32,088,147	34,232,520	37,541,256	40,771,352	43,675,855	46,433,233	47,894,671	51,209,641
9	Net investment base (average of beginning and end of year)		27,207,076	29,316,561	31,310,574	33,160,333	35,886,888	39,156,304	42,223,603	45,054,544	47,163,952	49,552,156
	Eastern district (excluding bankrupts)											
10	Cash	FM-18	141,075	161,460	181,515	197,805	221,790	241,935	259,335	277,860	281,130	300,060
11	Materials and supplies	FM-18	158,967	177,310	188,893	200,504	216,914	233,206	248,638	263,154	266,649	283,755
12	Transportation property (line 6 projected balance sheet)	Sch. 2-A(I)	5,127,548	5,428,615	5,612,020	5,891,833	6,351,726	6,776,665	7,110,880	7,380,583	7,487,032	7,786,765
13	Other elements of investment (account 80)	FM-18	64,389	64,389	64,389	64,389	64,389	64,389	64,389	64,389	64,389	64,389
14	Construction in progress (account 90)	FM-18	49,191	49,191	49,191	49,191	49,191	49,191	49,191	49,191	49,191	49,191
15	Transportation property less account 80 and account 90	L. 12-13-14	5,013,968	5,315,035	5,498,440	5,778,253	6,238,146	6,663,085	6,997,300	7,267,003	7,373,452	7,673,185
16	Lessor property	FM-18	801,487	801,487	801,487	801,487	801,487	801,487	801,487	801,487	801,487	801,487
17	Net investment base (end of year)	L. 10,11,15,16	6,115,497	6,455,292	6,670,335	6,978,049	7,478,337	7,939,713	8,306,760	8,609,504	8,722,718	9,058,487
18	Net investment base (average of beginning and end of year)		5,927,202	6,285,395	6,562,814	6,824,192	7,228,193	7,709,025	8,123,237	8,458,132	8,666,111	8,890,603
	Southern district											
19	Cash	FM-18	132,750	150,825	168,090	181,980	201,465	218,490	235,170	253,005	260,100	281,640
20	Materials and supplies	FM-18	157,758	178,612	191,230	204,044	221,810	239,713	258,657	276,630	284,126	308,090
21	Transportation property (line 6 projected balance sheet)	Sch. 3-A(I)	5,998,897	6,605,825	7,014,030	7,625,879	8,564,311	9,478,991	10,288,670	11,023,464	11,447,407	12,375,932
22	Other elements of investment (account 80)	FM-18	36,212	36,212	36,212	36,212	36,212	36,212	36,212	36,212	36,212	36,212
23	Construction in progress (account 90)	FM-18	88,481	88,481	88,481	88,481	88,481	88,481	88,481	88,481	88,481	88,481
24	Transportation property less account 80 and account 90	L. 21-22-23	5,874,204	6,481,132	6,889,337	7,501,186	8,439,618	9,354,298	10,163,977	10,898,771	11,322,714	12,251,239
25	Lessor property	FM-18	400,089	400,089	400,089	400,089	400,089	400,089	400,089	400,089	400,089	400,089
26	Net investment base (end of year)	L. 19,20,24,25	6,564,801	7,210,658	7,648,746	8,287,299	9,262,982	10,212,590	11,057,893	11,828,495	12,267,029	13,241,058
27	Net investment base (average of beginning and end of year)		6,057,219	6,887,729	7,429,702	7,968,022	8,775,140	9,737,786	10,635,241	11,443,194	12,047,762	12,754,043
	Western district (excluding Rock Island Railroad)											
28	Cash	FM-18	367,725	427,065	483,120	527,115	593,685	650,715	711,240	780,585	799,230	876,047
29	Materials and supplies	FM-18	527,445	618,033	677,802	734,130	817,588	899,404	992,211	1,089,520	1,121,722	1,238,706
30	Transportation property (line 6 projected balance sheet)	Sch. 4-A(I)	14,042,453	15,335,732	16,117,979	17,211,883	18,890,863	20,567,388	22,102,587	23,616,401	24,471,766	26,279,701
31	Other elements of investment (account 80)	FM-18	201,139	197,116	193,173	189,309	185,522	181,811	178,174	174,610	171,117	167,694
32	Construction in progress (account 90)	FM-18	158,820	158,820	158,820	158,820	158,820	158,820	158,820	158,820	158,820	158,820
33	Transportation property less account 80 and account 90	L. 30-31-32	13,682,494	14,979,796	15,765,986	16,863,754	18,546,521	20,226,757	21,765,593	23,282,971	24,141,829	25,953,187
34	Lessor property	FM-18	842,143	842,143	842,143	842,143	842,143	842,143	842,143	842,143	842,143	842,143
35	Net investment base (end of year)	L. 28,29,33,34	15,419,807	16,867,037	17,769,051	18,967,142	20,799,937	22,619,019	24,311,187	25,995,219	26,904,924	28,910,081
36	Net investment base (average of beginning and end of year)		14,614,427	16,143,422	17,318,044	18,368,096	19,883,539	21,709,478	23,465,103	25,153,203	26,450,071	27,907,502

best copy available

Forecast Methodology No. 19

FINANCIAL RATIO COMPUTATIONS

Byproducts of developing a projected funds flow model of the class I railroads are historical and projected balance sheet and income statements which in turn provide the necessary data base for financial ratio analysis. For this purpose, 16 financial ratios and related data elements have been selected upon the basis of their general usage and acceptance by both the financial community and the railroads. The rationale and method of computation, including the data sources, for calculating each of the ratios or ratio components are explained below. All line numbers given to calculate ratios for the years 1966-1975 are based on Annual Report Form R-1 for 1974.

FUNCTION OF RATIOS—CALCULATION OF HISTORICAL AND PROJECTED RATIOS

1. Working capital.—Working capital is defined as the excess of current assets over current liabilities. A statement of changes in financial position is a statement of sources and applications of working capital as well as the changes in each working capital account. Adequate working capital enables a company to conduct its businesses on the most economical basis, without financial stringency and also to meet emergencies and losses without danger of financial disaster. Advantages of adequate working capital include being able to take advantage of cash discounts, making it possible to promptly pay all current obligations, and to extend larger credit terms to customers. The change in working capital is a measure of the change in the liquidity position of the firm. This measure relates liquidity to the change in current assets and current liabilities. Liquidity, however, is not only a function of the change in short-term assets and liabilities. For example, an increase of long-term debt may actually decrease future liquidity rather than increase it. Thus, the change in working capital is not, by itself, a complete (sufficient) measure of liquidity.

On the basis of historical data, using Annual Report Form R-1 (1975) as a reference, working capital is calculated by subtracting schedule 200, line 63 (the average of column b and column c) from schedule 200, line 15 (the average of column b and column c).

On a projected basis, using the projected comparative balance sheet statements, working capital is calculated by subtracting line 10 of the balance sheet (the average of the beginning and end of year projected balance) from line 1 of the balance sheet (average of beginning and end of year projected balance).

2. Average daily working capital coverage.—Days of cash operating expenses in working capital represent the number of days existing working capital would fund operating expenses. This analysis, given adequate understanding of the components of working capital, measures the ability of a company to continue operations in the face of temporary economic setback. (It does not attempt to analyze the company's ability to service debt.) This measure is the dynamic equivalent of the "quick" or "acid-test" ratio, liquid assets to current liabilities. Both measures, of course, have meaning and can be used jointly to determine upper and lower limits on days of operations required to meet short-term financial obligations. For this meaning to hold, it is necessary that the current liabilities be greater than the asset measure (current assets or liquid assets).

On an historical basis, the number of days of average daily working capital coverage is calculated by dividing the difference of schedule 200, line 15 (the average of column b and column c) minus schedule 200, line 63 (the average of column b and column c) by the quotient of schedule 300, line 2 (column b) minus schedule 320, lines 47, 48, 68, 81, and 82 (column b) divided by 360 days.

For the forecast periods, the number of days of average daily working capital coverage is calculated by dividing working capital (as calculated in #1 above) by the quotient of line 2 of the projected income statement less retirements less depreciation (found in Forecast Methodology No. 8) divided by 360 days.

3. Operating ratio including net equipment rents.—The operating ratio expresses operating expenses as a percentage of gross revenues. This ratio is a fairly good index of operating efficiency and is, therefore, particularly important to management in judging its operations. By including net equipment rents, management can determine the additional effect that the equipment rents have on the efficiency of operations.

Based on historical data, this ratio is calculated by dividing schedule 300, line 2 (column b) plus line 21 (column b) by schedule 300, line 1 (column b). To obtain percent, the above quotient is then multiplied by 100.

To calculate the operating ratio including net equipment rents from the projected comparative income statements, divide line 2 minus line 9 (end of year balance) of the income statement by line 1 of the income statement (end of year balance). To obtain percent, the above quotient is then multiplied by 100.

4. Operating ratio excluding net equipment rents.—The operating ratio expresses operating expenses as a percentage of gross revenues. This ratio is a fairly good index of operating efficiency and is, therefore, particularly important to management in judging its operations.

Based on historical data referenced to Annual Report Form R-1 for 1974, this ratio is calculated by dividing schedule 300, line 2 (column b) by schedule 300, line 1 (column b). To obtain percent, the above quotient is then multiplied by 100.

For the forecast periods, this ratio is calculated by dividing line 2 of the projected income statement (end of year balance) by line 1 of the projected income statement (end of year balance). To obtain percent, the above quotient is then multiplied by 100.

5. Fixed and contingent charge coverage.—Fixed and contingent charge coverage is used mainly as a measure of the ability of a firm to meet cash outlay requirements imposed by interest-bearing debts. It is a liquidity measure needed in order to estimate the likelihood of a firm being able to meet its fixed financial obligations, especially payments to creditors. If a firm's earnings before interest and taxes are 20 times fixed charges, presumably there is a smaller likelihood that this firm will not be able to meet the interest payments than a firm with the same business risk characteristics whose earnings before interest and taxes are two times interest. There are difficulties with the fixed charge coverage ratio. It does not take the principal payment explicitly into account. Thus, while the fixed charge coverage ratio is a somewhat unreliable measure of ability to meet financial obligations, it can be meaningful if its limitations are recognized.

For the years 1966-1975, inclusive, this ratio is calculated by dividing the sum of schedule 300, line 48 and line 5 (column b) by the sum of schedule 300, line 54 (column b) and line 56 (column b).

Based on the projected income statements, this ratio is calculated by dividing the sum of line 14 and line 5 of the income statement (end of year projected balance) and projected total income taxes by line 18 of the income statement (end of year projected balance).

6. Turnover of transportation investment.—The turnover of transportation property investment roughly tests the efficiency of management in keeping plant properties employed. It is best used for year-to-year comparison of the same carrier.

On an historical basis, this ratio is calculated by dividing schedule 300, line 1 (column b) by the sum of schedule 200, line 1 (the average of column b and column c) and line 12 (the average of column b and column c) plus the difference of schedule 211-N-2, line 50 (sum of columns b, c, d, and e) minus schedule 211-N-1, line 39 (column e). (Schedule 211 N provides yearend data only. It is necessary to refer to prior annual reports for comparable beginning-of-year data in order to average transportation property.)

Based on the projected financial statements and Forecast Methodology No. 18, turnover of transportation investment is calculated by dividing line 1 of the projected income statement by the sum of cash, materials and supplies (average of beginning and yearend balance) as found in Forecast Methodology No. 11 plus line 4 of the projected balance sheet less "Other Elements of Investment" found in Forecast Methodology No. 18 less "Construction Work in Progress" also found in Forecast Methodology No. 18 less line 5 of the projected balance sheet plus "Lessor Property" found in Forecast Methodology No. 18.

7. Cash flow.—Cash flow is defined as income plus depreciation and retirements. Since cash flows are easily measured, when properly discounted for time and adjusted for risk, they are a good proxy for profits. Cash flows are a relevant measure of the impact of a decision on the company. Assuming the company has sufficient cash inflows with which to meet its cash obligations, an investment which is expected to generate substantial cash flows in its late years but adversely affect profits during the early years may be desirable regardless of short-run profitability. Since cash is a primary means of fulfilling financial obligations, forecasting the cash flows of the firm is an important part of financial analysis. After cash flows from operations and nonoperational sources have been forecasted, then management can make decisions about how to obtain needed funds or how to invest excess funds. The Commission can discern how these management decisions alter revenue need.

Using historical data referenced to the 1975 Annual Report Form R-1, cash flow is calculated by adding the sum of schedule 300, line 63 (column b) to schedule 320, lines 48, 63, 81, and 90 (column b).

For the years 1976-1985, inclusive, cash flow is calculated by adding line 21 of the projected income statement to retirements plus depreciation which are found in Forecast Methodology No. 8.

8. Throwoff to debt ratio.—The throwoff to debt ratio measures the ability of a company to service long-term debt principal, since cash throwoff is after provision for interest charged to debt principal. It is most significant for small- to intermediate-size carriers which generally finance equipment under instruments which require monthly payments. The ratio may be distorted for those carriers which finance under revolving credit agreements (borrowing again shortly after the repayment) where distinctions are not made for current maturities so long as the outstanding debt is within the established parameters.

On the basis of historical data, this ratio is calculated by dividing the sum of schedule 300, line 63 (column b) plus schedule 320, lines 48, 62, 81, and 90 (column b) by schedule 200, line 64 (column b).

Based on the projected financial statements and Forecast Methodology No. 8, this ratio is calculated by dividing the sum of line 21 of the income statement plus retirements and depreciation from Forecast Methodology No. 8 by line 11 of the projected balance sheet.

9. Ratio of ordinary income to operating revenues.—The ratio of ordinary income to operating revenues indicates the net productivity of each dollar of sales in relation to income earned by the firm exclusive of extraordinary items.

For the years 1966-1975, inclusive, this ratio is calculated by dividing schedule 300, lines 4, 5, and 57 (column b) by schedule 300, line 1 (column b).

Based on the projected income statements, this ratio is calculated by dividing lines 4, 5, and 19 of the projected income statement by line 1 of the projected income statement.

10. Ratio of depreciation to long-term debt due within 1 year.—The ratio of depreciation charges to 1 year current maturities on long-term debt roughly indicates the ability of the company to replace itself by attempting to equate the accountant's noncash depreciation expenses with the true cash outlays associated with the depreciation expenses.

On the basis of historical data, this ratio is calculated by dividing schedule 320, lines 62 plus 90 (column b) by schedule 200, line 64 (column b).

For the years 1976-1985, inclusive, this ratio is calculated by dividing depreciation from Forecast Methodology No. 8 by line 11 of the projected balance sheet.

11. Capital structure ratio.—The capital structure ratio indicates the relative investment of stockholders and creditors. It reflects strengths and weaknesses in the basic financing of operations. To some extent the cost of capital depends on the particular mixture of sources of financing selected. One purpose of the capital structure ratio is to provide a measure of the protection for senior securities and also to provide an index of the riskiness of common stock.

The capital structure ratio is calculated from historical data by dividing the sum of schedule 200, lines 64 and 70 (column b) by schedule 200, lines 64, 70, and 95 (column b).

For the forecast periods, the capital structure ratio is calculated by dividing the sum of lines 11, 12, 13, 14, 15, and 16 of the balance sheet by lines 11, !2, 13, 14, 15, 16, and 25 (all end of year balances) of the balance sheet.

12. Rate of return on net investment in R.R. property.—The rate of return on net investment in railroad property appraises the efficiency of management in the use of railroad property entrusted to it.

From historical data, the rate of return on net investment in railroad property is calculated by dividing schedule 300, line 22 (column b) by the sum of schedule 200, lines 1 (average of column b and column c) and line 12 (average of column b and column c) plus schedule 211 N-2, line 50 (columns b, c, d, and e) minus schedule 211 N-1, line 39 (column e). Note: Schedule 211 N provides yearend data only. Refer to prior annual reports for comparable beginning-of-year data in order that transportation property can be averaged.

For the forecast periods, the rate of return on net investment in railroad property is calculated by dividing net railway operating income by the sum of cash, and materials and supplies (average of beginning and yearend balance) as found in Forecast Methodology No. 11, plus line 4 of the projected balance sheet, less "Other Elements of Investment" found in Forecast Methodology No. 18 less "Construction Work in Progress" also found in Forecast Methodology No. 18 less line 5 of the projected balance sheet plus "Lessor Property" found in Forecast Methodology No. 18.

13. Rate of return on total capitalization.—The rate of return on total capitalization appraises the efficiency of management in the use of total capital entrusted to it.

For the years 1966-1975, inclusive, the rate of return is calculated by dividing the sum of schedule 300, lines 50, 51, 52, 53, 56, and 63 (column b) less line 31 (column b) by the sum of schedule 200, lines 64, 70, and 95 (the average of column b and column c).

The forecasted rate of return on total capitalization is calculated by dividing the sum of lines 16, 17, and 21 of the projected income statement by the sum of lines 11, 12, 13, 14, 15, 16, and 25 (all average of beginning and end of year balance) of the projected balance sheet.

14. Rate of return on shareholders' equity.—The rate of return on shareholders' equity indicates the earnings rate on resources provided by the owners. Assuming that investors require more return for more risk and that debt capital suppliers are subject to less risk than equity suppliers of the same firm, it then follows that debt holders will accept a lower rate of return than that required by the equity holders of an all equity-financed company.

The rate of return on shareholders' equity is calculated from historical data by dividing schedule 300, line 63 (column b) by schedule 200, line 95 (average of column b and column c).

The forecasted rate of return on shareholders' equity is calculated by dividing line 21 of the projected income statement by line 25 (average of beginning and end of year balance) of the projected balance sheet.

15. Dividend payout ratio.—The dividend payout ratio, determined by dividing dividends declared for a period by the net income for the same period, indicates the proportion of net income paid out to shareholders versus the proportion of net income reinvested in the business. Dividends are defined as cash dividends, which is the generally accepted method of computation.

For the years 1966-1975, inclusive, the dividend payout ratio is calculated by dividing line 23 of the balance sheet by line 21 of the income statement.

This ratio is forecasted by dividing cash dividends by line 21 of the Projected Income Statement.

16. Operating income profit margin.—The operating income profit margin indicates the net productivity of each dollar of sales after operating expenses.

The operating income profit margin is calculated by dividing schedule 300, line 22 (column b) by schedule 300, line 1 (column b).

For the forecast periods, the operating income profit margin is calculated by dividing line 10 of the projected income statement by line 1 of the projected income statement.

Forecast Methodology No. 20

SHORT-TERM MODEL

I. *Introduction*

This Forecast Methodology presents a short-term model for projecting quarterly railroad freight traffic, revenues, and expenses by district. The model is being developed to provide forecasts for up to 8 quarters beyond the most recent historical data available. Before proceeding to a detailed discussion of the proposed methodology for forecasting traffic, revenues, and expenses, a brief explanation of the need for a short-term model is in order. Thus, the following section will differentiate the short-term model from the long-term model, discussed in the preceeding forecasting methodologies in terms of focus, intended use, and methodology. Next, an overview of the short-term model will be presented, followed by a detailed description of the proposed methodology.

II. *Short-term v. long-term*

The long-term model described in this report is developed using annual data and is directed toward assessing railroad revenue requirements necessary to arrest continued deterioration of railroad assets—roadway, structures, and equipment. Hence, the long-term model projects normalized trends in capital and maintenance expenditure needs for up to 10 years beyond the most recent historical data. These normalized projections along with the long-term model projections of the remaining income statement and balance sheet items yield estimates of any short-fall in revenues needed to maintain railroad capacity at current service levels similar to the objectives of Ex Parte No. 305, Nationwide, Increase of Ten Percent in Freight Rates and Charges. In projecting the revenue needs to maintain railroad capacity intact, the long-term model includes trends in general rate increases designed to off-set the cost-increasing effect of inflation.

In contrast to the long-term model, the short-term model is being developed using quarterly data and is focused on the near-term course of railroad freight traffic, revenues, and actual expenses (as opposed to normalized levels for capacity related expenses). Hence, the short-term model will be able to accomodate the most recent data on the economy and the railroads in evaluating general rate increases requests. The short-term model requires forecasts of actual levels of capital and maintenance expenditures. The accumulation and maintenance of an adequate capital base to supply future service demand on the other hand, is by nature a long-term issue and, therefore, a primary concern of the long-term model. Thus, in large part, the short-term model will take capacity as fixed and project the likely course of near-term revenues and expenses.

It is antcipated that the short- and long-term models will be used together in evaluating railroad revenue needs. The short-term model will utilize the most recent data available in assessing the impact of current and expected near-term economic conditions on railroad revenue needs. The long-term model will then evaluate the adequacy of any revenue needs determined in the short-term model with respect to the railroads ability to maintain adequate capacity for meeting long-term service demand.

Another use of the short-term model will be as an addition to the long-term forecasting methodology (as opposed to the long-term model). Due to its annual time frame, the long-term model cannot readily accommodate the most recent data available on the economy and the railroads. The short-term model, however, will accommodate the most recent quarters of actual data and can forecast several quarters into the future so as to provide more recent annual information. In this regard, even more recent data and analysis than quarterly can be incorporated in the short-term methodology. With respect to railroad traffic, revenues, and those expenses not related to capacity, the quarterly time frame of the short-term model permits inclusion of the most recent information and analysis on the economy and the railroads in the assumptions and parameter of the long-term model. This capability will provide a realistic transition from the current cyclical behavior of the economy and the railroads to an assessment of railroad revenue requirements necessary to maintain adequate capacity to meet the long-term projection of service demand.

III. *The short-term model—An overview*

The short-term model flows from estimates of ton-miles and carloadings by district to estimates of district revenues and expenses. At all points the short-term model will take as inputs information on the current and expected performance of the entire economy, as well as individual sectors. In particular, ton-miles and carloadings will be related to the production and freight transportation requirements of specific industries and sectors of the economy. Attention will be focused on the differences among the districts with respect to types of commodities hauled and how ton-miles vary by type of commodity. Once measures of freight revenue ton-miles are obtained, this traffic will be translated into dollar revenues.

Freight revenues by district are related to the level and structure of rates and the commodity and length of haul composition of freight traffic. The short-term model does not include unrequested rate increases in the forecast period as does the long-term model, but will have the capacity to assess the impact of a proposed rate increase. However, revenue per ton-mile is not constant at the most recent level and structure of rates but varies according to the commodity and distance composition of freight movement. Hence, both the commodity and ton-mile estimates discussed above will enter into the determination of district freight revenues. Thus, the short-term model will facilitate assessment of the impact on revenues of a proposed rate increase.

Expenses, in a sense, are the most difficult elements in forecasting railroad revenue requirements. Freight revenue traffic is largely limited by overall economic activity in those sectors from which the demand for rail service is derived. Similarly, revenues are largely determined by this demand as well as the current level and structure of rates. Were it not for compositional changes, revenues would be solely determined by this demand and the level and structure of rates. Unlike traffic and revenues, expenses are affected by a host of current and expected conditions. The current operating expenses of railroads depend on the amounts of labor, materials, and supplies used, their costs per unit, the current capital and asset structure, and the cost of capital. While the prices of the various inputs used by railroads are determined outside the railroad industry, the amounts of these inputs are determined by traffic levels, productivity, and short-run financial conditions. Thus both inflation and labor and material needs must be accommodated in estimating railroad expenses.

In addition to the above, railroads need to meet certain financial criteria in an attempt to insure the future availability of credit and, thereby, survival. The financial constraint of adequately covering fixed charges exerts a very real impact on railroad expenses in any given quarter. In order to maintain a respectable posture (as dictated by financial markets) with respect to income available for fixed charges, railroad maintenance is often deferred when current revenues less expenses, including normal maintenance, resulted in a less than comfortable margin of income over fixed charges. This choice between short-run financial considerations and the long-run maintenance of capacity, with is a managerial prerogative, is an important element in evaluating the impact of current and anticipated economic conditions on the railroads and will be discussed further below.

IV. *The short-term model—Methodology*

A. *Traffic and revenues by district*

1. *Traffic*

Railroad freight traffic will be estimated in terms of ton-miles and carloadings by type of commodity. The general approach will be to relate carloadings and ton-miles to the factors determining the demand for railroad freight transportation. At a minimum, carloadings by type of commodity will be related to the production of specific industries (*e.g.*, coal production will be used in forecasting coal carloadings). However, industry production is not the only source of transportation demand. For some commodities, overall inventory cycles may prove an important determinant. While production and inventory changes determine the total amount of commodity to be shipped, this along with the transport costs and service alternatives faced by shippers, determine how much of a particular commodity will be shipped by rail. Thus, current data investigation and empirical testing is directed toward developing intermodal demand equations which relate carloadings by type to the total quantity of the commodity to be shipped and railroads rates and service characteristics relative to the rates and service characteristics of motor carriers and water carriers where appropriate.

Given estimates of commodity carloadings, the next step is to determine revenue ton-miles. Unfortunately, ton-miles by commodity are not available as are carloadings. But, ton-miles per carload data are available on an annual basis from the 1-percent Carload Waybill Statistics sample. Current analysis and empirical testing is directed at determining the most appropriate method of utilizing this data in estimating district ton-miles. The most promising method appears to be to use the waybill data on ton-miles per commodity carloading as weights in constructing an index of the impacts of changing commodity composition on district revenue ton-miles.

As mentioned, the equations for forecasting carloadings and ton-miles will be estimated using quarterly data. The Commission has available to it, from DRI,[37] short-term forecasts of the U.S. economy in considerable industrial detail. These forecasts are obtained using quarterly data and are revised on a monthly basis. As a result, industry production data consistent with the overall economic outlook will be available as inputs into the short-term model for up to 8 quarters into the future. Additional data on the first quarter of the forecast period can be obtained for critical industries from such sources as the Bureau of Mines, the Coal Institute, the Department of Agriculture, the Iron and Steel Institute, and Wards Automotive. Further, as discussed earlier, the forecast will be able to accommodate Commission analysis based on weekly data on carloadings available from the American Association of Railroads.

2. *Revenues*

Railroad freight revenues are determined by the level and structure of rates, the commodities shipped, and the length of haul for these commodities. If the commodity detail were at the level at which rates are specified and ton-miles per commodity were known, the estimation of revenues would be straightforward. Since the short-term model does not have a built-in-mechanism for rate increases, the most recent revenue per ton-mile data could be used with commodity ton-mile estimates to obtain revenues. However, ton-mile data are not available quarterly on a commodity basis. The available inputs into determining district revenues are district ton-miles and carloadings as discussed above and annual data on revenues and length of haul from the 1-percent waybill sample cited earlier.

As in the case of ton-miles, these annual data on revenue per commodity ton-mile are being analyzed with a view to constructing an index of the impact of changing commodity and length of haul composition on revenues. Thus weights based on the waybill sample will be used with estimates of commodity carloadings and ton-miles to derive district freight revenues. The final specification of this relationship awaits further analysis and empirical testing.

B. *Expenses by district*

1. *Expenses by function* v. *expenses by type*

Clearly both of the categorizations of expenses are important for analyzing railroad revenue requirements. An analysis based on expenses by function (accounting categories) stresses the response of railroads to financial considerations and is focused on the distinction between the costs of hauling freight and the costs of maintaining capacity to haul freight in the future. On the other hand, an analysis based on expenses by type (input categories) permits specific attention to be focused on cost increases due to factors outside the railroad industry. The prices of many of the various types of inputs are totally determined outside the railroad industry. Yet, an increase in the price of any or all of these inputs does not automatically translate into a reduction of railroad income. Changes in technology, traffic composition, productivity, and corporate organization all affect the extent to which a particular price increase translates into a cost increase and thereby a possible reduction of income.

---

[37] Data Resources, Inc., Lexington, Mass.

Railroad expenses are determined by the amounts of inputs—labor, materials, supplies, and service—the prices paid for these items, and fixed charges due to owning or leasing assets. However, as discussed above, the amounts of these inputs depend crucially on financial considerations over and above the direct costs of inputs. In an effort to maintain necessary access to capital markets, the railroads strive for an income position which reflects adequate resources to cover fixed charges (i.e., interest charges on indebtedness). This position is achieved by deferring certain expenses when income is low and attempting to make up these deferrals in more prosperous times.

While some expenses are directly related to traffic (*e.g.*, those expenses reflected in the "Transportation" Account) and others are virtually fixed in the short-run (*e.g.*, overhead expenses such as those reflected in the "General" Account), some are neither directly related to traffic nor fixed. In particular, many of the expenses reflected in the "Maintenance" Accounts are largely deferrable. As costs increase relative to earnings, maintenance expenditures are often reduced significantly to prevent an unacceptable deterioration in income available for fixed charges.

In order to adequately assess railroad revenue requirements, all of the above determinants and constraints should be considered. Ideally, equations should be developed for the various types of inputs for each functional category. Thus, the demand for labor, which is determined by somewhat different factors depending on its use (*e.g.*, directly for transportation versus maintaining roadway), could be more precisely specified. Unfortunately, however, quarterly data on types of inputs within functional categories are not available. Hence, the approach taken will be to develop equations to forecast total expenses both ways—broken down by function and broken down by type. The next section discusses the methodology for forecasting expenses by fucntions and is followed by a discussion of the forecasting methodology for types of expenses.

2. *Expenses by function*

On a functional basis, the three largest accounts are Maintenance of Way and Structures, Maintenance of Equipment, and Transportation. Together, these three categories account for about 90 percent of operating expenses with transportation accounting for about one-half and the two maintenance categories at approximately 20 percent each. Maintenance of roadway and structures and maintenance of equipment will be discussed together as they are analogous (with the exception of maintenance of roadway being presumed to be more responsive to financial constraints).

The depreciation and retirements components of the maintenance accounts will be related to the property being depreciated. The "All Other Maintenance" category will be treated as a partially deferrable expense. While these expenditures are related to the stock of assets being maintained, they are also related to the financial constraints discussed earlier. The equalization charge, which attempts to smooth these maintenance charges over the course of a calendar year, will be specified as an adjustment process relating quarterly changes to the expected annual total.

The "Transportation" category reflects the direct current costs of operating the railroad. Hence, these expenditures will be related to traffic and the prices of the various inputs—fuel, supplies, and labor—faced by the railroads. As in the case of revenues, the commodity and distance composition of traffic is expected to prove important. Here, however, the emphasis will be more on carloadings and the number of trains operated. While revenues are closely related to the distance involved, expenses are more related to the operation of trains and the labor intensity of the particular commodities handled.

The remaining accounts such as the traffic and general expense accounts are basically overhead and are expenses incurred just because the railroads exist, whether or not a service is rendered. Here it will be important to identify the trend in real costs in order to treat the effects of inflation. These accounts are stable, thus, changes are expected to primarily result from changes in the prices of the underlying inputs such as labor and supplies. Variation of the quantities of these inputs due to some outside or behavioral force is not expected to be significant for these accounts.

Beyond operating expenses, taxes are by far the largest expense category. Payroll taxes are determined by the number of employees, time worked, wage rates, and the tax rate. In relating payroll taxes to these items, the functional approach to forecasting expenses will be fused with the type of expense approach. Federal income taxes are determined by taxable income, tax credits and the tax rate. Thus, revenues, expenses, and current investment will come together to explain Federal income taxes. Other taxes are primarily State and local income and property taxes and will be related to railroad assets and possibly income.

Net equipment and joint-facility rents includes both rental income and rental expense. An attempt will be made to separate these and relate rent to the amount and type of capital being rented. This will likely entail projecting the trend of rented assets. Some of the items rented are no doubt overhead items such as office space, while others such as locomotives and rolling stock may be directly related to the level of traffic.

Fixed charges are primarily interest expense and are determined by the level of debt outstanding and the interest rates paid. These charges will be related to outstanding debt and trends in debt financing. As discussed earlier, these fixed charges have a bearing on maintenance expenditures. The amount spent on maintenance in part determines the amount of income left on cover fixed charges. Current analysis is directed at making this relationship among revenues, expenses, maintenance, and fixed charges explicit.

3. *Expenses by type*

Several types of expenses are identical to functional categories of expenses. Depreciation, taxes, rents, and fixed charges are types of expenses and functions as those terms are used in the preceeding discussion. In these cases the two approaches coincide. Other types of expenses—labor, materials, supplies and services—are distributed across functions. All other maintenance of way and structures, the analogous category for equipment, and the overhead and transportation accounts all contain parts of the total wage, materials, supplies, and services expenditures.

As mentioned earlier, these types of expenses should be determined within each accounting category so as to fully exploit the quantity, price, and financial constraints of railroad expenses. However, due to data limitations it may not be possible to do more than estimate labor, fuel, and all other materials, and supplies costs at the aggregate level. This will allow assessing the impact on railroad costs of negotiated wage increases, fuel price increases, and increases in the aggregate price of materials and supplies. Current specification efforts are directed toward making explicit the important distinction between price or wage increases and increases in cost per unit of output. Price increases do not necessarily translate into increases in unit costs. Certainly, price increase may be at least partially offset by increases in productivity or such changes as a shift toward less labor or material intensive commodity traffic. Thus, the following discussion will focus on labor, fuel, and total material, supplies, and services costs less fuel.

Labor expense is determined by the number of employees, service hours worked, wage rates, and the fringe benefits package. The primary determinants of employment levels and service hours are the direct traffic requirements of car and train movements and the degree of maintenance deferrals or makeups, which cause nontraffic related shifts in the work force and changes in productivity. It is expected that an equation will be developed to utilize railroad traffic and maintenance requirements in estimating either employment or service hours. The other measure of labor input will be derived from the resulting estimate. Thus, for example, if service hours are found to be highly correlated with train-miles and maintenance levels, then employment will be estimated based on the trend in service hours per employee.

Given estimates of employment and service hours, the next step is to determine compensation. To do this an average compensation per employee or service hour forecast is required. An important element in this effort is the ability to translate negotiated wage increases into the required average compensation. Thus, it is anticipated that an equation will be developed relating changes in the average wage to the stated wage increases by union contract group. Similarly, pension and health and welfare benefits will be related to employment, compensation, and stated increases in these items in union contracts.

Fuel costs will be derived from constant dollar fuel consumption levels and an index of changes in fuel prices. This constant dollar fuel consumption is expected to be most closely related to train-miles. The use of fuel thus projected will then be converted to current dollar fuel costs using a price projection based on projections of the Wholesale Price Index for fuel. Similarly, materials and supplies less fuel will be projected in terms of constant dollars and a price index. In developing an equation for materials and supplies less fuel, it is expected that the maintenance accounts will be far more influential than the transportation accounts.

The estimates of labor, fuel, and materials costs, as discussed, provide a mechanism for assessing the impact of inflation on costs by separating prices and quantities. Further, as alluded to, the approach to developing these equations offer several possibilities for integrating the function versus type of expense approaches. As is the case with the long-term model, the development of forecasting techniques is evolutionary. As our experience and circumstances dictate, modifications in methodologies will be made.

APPENDIX K

Table of Contents

CLASS I LINE-HAUL RAILROADS HISTORICAL AND PROJECTED FINANCIAL STATEMENTS

Title of statement	Statement dates	Code
All districts, excluding bankrupt carriers and ConRail:		
Historical balance sheet	Years ended December 31, 1966-75	1-A(H)
Historical income statement	do	1-B(H)
Historical source of funds statement	do	1-C(H)
Historical use of funds statement	do	1-D(H)
Historical financial ratios	do	1-E(H)
Inflated dollars		
Projected balance sheet	Years ending December 31, 1976-85	1-A(I)
Projected income statement	do	1-B(I)
Projected source of funds statement	do	1-C(I)
Projected use of funds statement	do	1-D(I)
Projected financial ratios	do	1-E(I)
Shortfall elimination statement	do	1-F(I)
Constant dollars		
Projected balance sheet	do	1-A(C)
Projected income statement	do	1-B(C)
Projected source of funds statement	do	1-C(C)
Projected use of funds statement	do	1-D(C)
Projected financial ratios	do	1-E(C)
Shortfall elimination statement	do	1-F(C)
Eastern district, excluding bankrupt carriers and ConRail:		
Historical balance sheet	Years ended December 31, 1965-74	2-A(H)
Historical income statement	do	2-B(H)
Historical source of funds statement	Years ending December 31, 1966-74	2-C(H)
Historical use of funds statement	do	2-D(H)
Historical financial ratios	do	2-E(H)
Inflated dollars		
Projected balance sheet	Years ending December 31, 1975-84	2-A(I)
Projected income statement	do	2-B(I)
Projected source of funds statement	do	2-C(I)
Projected use of funds statement	do	2-D(I)
Projected financial ratios	do	2-E(I)
Shortfall elimination statement	Years ending December 31, 1976-84	2-F(I)
Constant dollars		
Projected balance sheet	Years ending December 31, 1975-84	2-A(C)
Projected income statement	do	2-B(C)
Projected source of funds statement	do	2-C(C)

Table of Contents—Continued

CLASS I LINE-HAUL RAILROADS HISTORICAL AND PROJECTED FINANCIAL STATEMENTS—CONTINUED

Title of statement	Statement dates	Code
Constant dollars—Con.		
Projected use of funds statement	Years ending December 31, 1975-84	2-D(C)
Projected financial ratios	do	2-E(C)
Shortfall elimination statement	Years ending December 31, 1976-84	2-F(C)
Southern district:		
Historical balance sheet	Years ended December 31, 1965-74	3-A(H)
Historical income statement	do	3-B(H)
Historical source of funds statement	Years ended December 31, 1966-74	3-C(H)
Historical use of funds statement	do	3-D(H)
Historical financial ratios	do	3-E(H)
Inflated dollars		
Projected balance sheet	Years ending December 31, 1975-84	3-A(I)
Projected income statement	do	3-B(I)
Projected source of funds statement	do	3-C(I)
Projected use of funds statement	do	3-D(I)
Projected financial ratios	do	3-E(I)
Shortfall elimination statement	Years ending December 31, 1976-84	3-F(I)
Constant dollars		
Projected balance sheet	Years ending December 31, 1975-84	3-A(C)
Projected income statement	do	3-B(C)
Projected source of funds statement	do	3-C(C)
Projected use of funds statement	do	3-D(C)
Projected financial ratios	do	3-E(C)
Shortfall elimination statement	Years ending December 31, 1976-84	3-F(C)
Western district, excluding Chicago, Rock Island & Pacific R.R. Co.:		
Historical balance sheet	Years ended December 31, 1965-74	4-A(H)
Historical income statement	do	4-B(H)
Historical source of funds statement	Years ended December 31, 1966-74	4-C(H)
Historical use of funds statement	do	4-D(H)
Historical financial ratios	do	4-E(H)
Inflated dollars		
Projected balance sheet	Years ending December 31, 1975-84	4-A(I)
Projected income statement	do	4-B(I)
Projected source of funds statement	do	4-C(I)
Projected use of funds statement	do	4-D(I)
Projected financial ratios	do	4-E(I)
Shortfall elimination statement	Years ending December 31, 1976-84	4-F(I)

Table of Contents—Continued

CLASS I LINE-HAUL RAILROADS HISTORICAL AND PROJECTED FINANCIAL STATEMENTS—CONTINUED

Title of statement	Statement dates	Code
Constant dollars		
Projected balance sheet	Years ending December 31, 1975-84	4-A(C)
Projected income statement	do	4-B(C)
Projected source of funds statement	do	4-C(C)
Projected use of funds statement	do	4-D(C)
Projected financial ratios	do	4-E(C)
Shortfall elimination statement	Years ending December 31, 1976-84	4-F(C)

SCHEDULE 2-A(H)

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
HISTORICAL BALANCE SHEET
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

LINE NO.	BALANCE SHEET ITEM	HISTORICAL BALANCE SHEET									
		1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
1.	CURRENT ASSETS	664910	622560	630743	656820	679396	701506	754646	900307	1101220	1126349
2.	SPECIAL FUNDS	33346	29142	10975	25386	28897	19936	20513	23632	48366	61352
3.	INVESTMENTS	673890	682531	796503	806210	883872	839161	751761	743960	973232	975415
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	5831120	6044435	6043036	6134112	6311616	6362022	6398473	6417094	6466664	6803591
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-1525805	-1566717	-1557525	-1577454	-1648408	-1677035	-1730182	-1778062	-1853102	-1948704
6.	TOTAL TRANSPORTATION PROPERTY (NET)	4305314	4477716	4485509	4556656	4663207	4684986	4668291	4639031	4613561	4854887
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	62775	66249	66481	65682	65758	67365	66641	65491	63072	65813
8.	OTHER ASSETS & DEFERRED CHARGES	47413	49255	50055	56664	53504	61914	65692	84036	62510	66459
9.	TOTAL ASSETS	5787649	5927393	6040567	6167419	6374635	6374808	6327544	6456597	6861961	7150275
10.	CURRENT LIABILITIES	478823	489608	514870	560427	600654	606283	676879	720199	797354	844255
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	110561	111568	139512	178929	145538	140854	162498	128958	122256	138838
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	942996	936963	907449	847105	872299	891722	826171	843125	791958	738284
13.	EQUIPMENT OBLIGATIONS	766600	871153	859645	868204	910313	902149	862471	793394	730952	861202
14.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
15.	DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
16.	AMOUNTS PAYABLE TO AFFILIATED COMPANIES	400749	435937	445161	551021	540151	512961	523917	545078	573282	626233
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES	75283	71776	74003	75733	75109	101058	108324	123234	147462	176605
18.	OTHER LIABILITIES AND DEFERRED CREDITS	218713	229135	229985	228492	220472	232882	246466	271761	1018018	1015026
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	1118348	1133747	1176409	1169689	1190050	1188051	1186060	1126340	1123139	1034116
20.	CAPITAL SURPLUS	107117	104371	176103	176100	348988	436814	512725	640196	736769	870856
21.	RETAINED INCOME-BEGINNING YEAR	1469813	1568460	1543136	1517431	1511719	1471060	1362054	1292033	1264312	818771
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS	206803	99949	89953	106636	72621	-19542	24595	108088	-325648	151307
23.	MINUS CASH DIVIDENDS	128156	125273	115655	112348	113280	89464	94616	135809	119893	125218
24.	RETAINED INCOME-END OF YEAR	1568460	1543136	1517431	1511719	1471060	1362054	1292033	1264312	818771	844860
25.	TOTAL SHAREHOLDERS EQUITY	2793925	2781254	2869943	2857508	3010098	2986919	2990818	3030848	2680679	2749832
26.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	5787649	5927393	6040567	6167419	6374635	6374808	6327544	6456597	6861961	7150275

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
HISTORICAL BALANCE SHEET
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

SCHEDULE 3-A(H)

LINE NO.	BALANCE SHEET ITEM	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
		HISTORICAL BALANCE SHEET									
1.	CURRENT ASSETS	465158	455259	497705	595025	604005	631792	623543	791087	876628	852931
2.	SPECIAL FUNDS	36375	14662	52551	23479	21901	16819	52730	39361	53962	46732
3.	INVESTMENTS	406830	422152	426806	462216	495459	647418	636909	648894	1083594	1136065
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	5423135	5538045	5653879	5850751	6059183	6286355	6195314	6398340	6758918	6953538
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-1477090	-1501780	-1566847	-1606965	-1652143	-1713956	-1657634	-1702178	-1764124	-1838627
6.	TOTAL TRANSPORTATION PROPERTY (NET)	3946045	4036264	4087032	4243786	4407039	4572399	4537679	4696161	4994793	5114911
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	75412	76693	75732	78066	77283	80259	80566	80470	75494	81288
8.	OTHER ASSETS & DEFERRED CHARGES	42960	46585	44827	52517	55407	61601	109393	103993	89241	90892
9.	TOTAL ASSETS	4972760	5051614	5184651	5455589	5661094	6010289	6040822	6359906	7171712	7327819
10.	CURRENT LIABILITIES	341283	329974	351506	403172	438547	456929	470691	530338	670088	673826
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	104581	100293	115390	127327	142187	163831	140517	176088	167380	166432
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	814726	823128	835549	840230	802348	792217	756199	779154	811137	784172
13.	EQUIPMENT OBLIGATIONS	728838	750336	768847	817222	879369	956529	1000123	1082636	1132598	1206191
14.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
15.	DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
16.	AMOUNTS PAYABLE TO AFFILIATED COMPANIES	39266	42655	46246	49821	51497	59786	59365	61569	57652	74615
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES	27361	27393	31031	78205	76812	72457	83169	67569	56337	54116
18.	OTHER LIABILITIES AND DEFERRED CREDITS	72216	71047	71275	80561	95216	120268	123402	115127	698242	688065
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	833268	814227	817333	835540	847887	825825	630910	631417	628841	627529
20.	CAPITAL SURPLUS	165780	187785	191284	206597	228576	433279	642772	643238	684706	687020
21.	RETAINED INCOME-BEGINNING YEAR	1775231	1845443	1904774	1956194	2016934	2098655	2129169	2133673	2272770	2264731
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS	141862	131383	125515	137923	161289	124082	125165	224718	105061	200715
23.	MINUS CASH DIVIDENDS	71650	72052	74095	77183	79568	93568	120661	85621	113100	99593
24.	RETAINED INCOME-END OF YEAR	1845443	1904774	1956194	2016934	2098655	2129169	2133673	2272770	2264731	2365853
25.	TOTAL SHAREHOLDERS EQUITY	2844491	2906786	2964811	3059071	3175118	3388273	3407355	3547425	3576278	3680402
26.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	4972760	5051614	5184651	5455589	5661094	6010289	6040822	6359906	7171712	7327819

SCHEDULE 2-B(N)

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
HISTORICAL INCOME STATEMENT
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

LINE NO.	INCOME STATEMENT ITEM	HISTORICAL INCOME STATEMENT 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
1.	RAILWAY OPERATING REVENUES	1966127	1939443	2056705	2148279	2267061	2309152	2402075	2613532	3042695	2996711
2.	OPERATING EXPENSES	1446363	1490368	1574282	1663631	1801238	1842868	1883710	2046868	2302349	2411854
3.	NET REVENUE FROM RAILWAY OPERATIONS	519764	449074	482423	484648	465823	466284	518365	566664	740346	584857
4.	TOTAL TAX ACCRUALS	193354	169079	191571	188765	196829	197201	217464	267725	369796	302823
5.	PROVISIONS FOR DEFERRED TAXES ...	0	0	0	0	0	0	0	0	63984	37711
6.	RAILWAY OPERATING INCOME	326411	279995	290853	295882	268994	269083	300902	298939	306566	244323
7.	NET RENTS	-67515	-91992	-97468	-106493	-109276	-115176	-115275	-120674	-138969	-143766
8.	NET RAILWAY OPERATING INCOME	258896	188002	193385	189389	159717	153906	185626	178264	167596	100557
9.	OTHER INCOME	57619	66464	66455	63384	72404	61448	54632	75759	167859	123453
10.	TOTAL INCOME	316515	254467	259839	252773	232121	215354	240258	254023	335455	224010
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	10639	12838	9378	10874	12897	20898	13339	22319	19467	8482
12.	INCOME AVAILABLE FOR FIXED CHARGES	305876	241629	250461	241899	219224	194455	226919	231704	315988	215528
13.	RENT FOR LEASED ROADS & EQUIPMENT	18220	16964	18100	18015	11154	11442	11988	11399	10784	10959
14.	INTEREST ON FUNDED DEBT	84932	92640	92425	94363	104071	110113	108552	106256	109023	108254
15.	INTEREST ON UNFUNDED DEBT	423	284	480	1077	4543	3854	3658	3969	4244	4139
16.	TOTAL FIXED CHARGES*	103575	109888	111006	113455	119768	125409	124198	121624	124051	123352
17.	ORDINARY INCOME	202301	131741	139454	128443	99455	69046	102721	110080	191937	92176
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	1547	938	-13568	-22585	-76438	-71019	8822	23563	-9640
19.	NET INCOME	202301	133288	140392	114875	76868	-7392	31702	118902	215500	82536

*INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL SCHEDULE 2-C(N)
HISTORICAL FUNDS FLOW
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

FUNDS FLOW ITEM	HISTORICAL FUNDS FLOW 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	202301	133288	140392	114875	76868	-7392	31702	118902	215500	82536
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY DEPRECIATION	27756	28334	28967	29532	30025	30570	31888	32956	33583	33969
EQUIPMENT DEPRECIATION	101446	108773	113266	114093	118480	121535	123076	122239	123256	125788
ROAD PROPERTY RETIREMENTS	1129	2097	1363	7594	3638	2689	3138	4940	3895	1145
EQUIPMENT RETIREMENTS	-316	-4063	-4802	-2575	-2412	-1333	2561	-604	-1844	-1234
TOTAL DEPRECIATION AND RETIREMENTS	130015	135121	138769	148644	149731	153461	160663	159531	158890	159668
INCREASES/DECREASES (-) TO ALL RESERVES	-2061	-3507	2227	1730	-624	25949	7266	14910	24228	29143
INTEREST IN DEFAULT	0	0	977	0	0	0	0	0	0	0
DEFERRED FEDERAL INCOME TAX	0	0	0	0	0	0	0	0	63984	37711
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	64260	27955
TOTAL FUNDS FROM OPERATIONS	330255	264902	282365	265249	225975	172018	199631	293343	398342	281103
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	53195	17019	19480	17651	0	0	0	0	21772
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	44771	87340	7861	0	25772
DECREASE IN MISCELLANEOUS PROPERTY	0	0	0	799	0	0	724	1150	2419	0
DECREASE IN MISCELLANEOUS ASSETS	2952	2362	17367	0	0	551	0	0	0	0
INCREASE IN FUNDED DEBT	0	0	0	0	25194	19423	0	16954	0	0
INCREASE IN EQUIPMENT OBLIGATIONS	191131	105560	16436	47976	8718	0	0	0	0	146832
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN AMOUNT PAYABLE TO AFFILIATED COMPANIES	0	35186	9226	105860	0	0	10976	21161	28204	52951
INCREASE IN OTHER LIABILITIES	11690	10422	0	0	0	12410	13584	25295	682273	0
SALE OF CAPITAL STOCK	0	15399	42662	0	20361	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	2210	0	71729	0	172888	87826	75911	127471	98573	132087
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	4502	0	0	0	0	0	0	0	0	68771
TOTAL SOURCES OF FUNDS	542965	487026	456822	439364	470787	336999	388166	493235	1209811	729288

NOTE: SOURCE AND APPLICATION TOTALS NOT EQUAL DUE TO ROUNDING.

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL SCHEDULE 2-B(N)
HISTORICAL FUNDS FLOW
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

FUNDS FLOW ITEM	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
				HISTORICAL FUNDS FLOW						
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	128156	125273	115655	112348	113280	89464	94616	135809	119893	125218
INCREASE IN WORKING CAPITAL	0	0	0	0	0	16481	32544	52341	123758	0
INCREASE IN INVESTMENT IN SECURITIES	4273	8641	114272	9407	77662	0	0	0	165072	0
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	355725	307523	146582	219791	256282	175240	143968	130271	133420	400994
INCREASE IN MISCELLANEOUS PROPERTY	2461	3474	232	0	76	1607	0	0	0	2741
INCREASE IN MISCELLANEOUS ASSETS ..	0	0	0	21020	351	0	4355	21663	3008	16935
DECREASE IN FUNDED DEBT	85091	6033	29514	60344	0	0	65551	0	51167	53676
DECREASE IN EQUIPMENT OBLIGATIONS .	0	0	0	0	0	12848	38034	82617	69144	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN AMOUNT PAYABLE TO AFFILIATED COMPANIES	1452	0	0	0	10870	27210	0	0	0	0
DECREASE IN OTHER LIABILITIES	0	0	127	1493	8020	0	0	0	0	40703
REPURCHASE OF CAPITAL STOCK	2123	0	0	6720	0	1999	1991	59720	3201	89023
DECREASE IN CAPITAL SURPLUS	0	2746	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	0	33339	50442	8239	4247	12150	7107	10814	541148	0
TOTAL APPLICATIONS OF FUNDS	579281	487029	456824	439362	470788	336999	388166	493235	1209811	729288

NOTES: SOURCE AND APPLICATION TOTALS NOT EQUAL DUE TO ROUNDING.

1974 INCREASE IN MISCELLANEOUS DEBITS TO RETAINED INCOME DUE PRIMARILY TO UNIFORM SYSTEM OF ACCOUNT CHANGES INCLUDING THE EQUITY BASIS OF ACCOUNTING FOR SECURITY INVESTMENTS AND THE DEFERRED METHOD OF INTERPERIOD INCOME TAX ALLOCATION.

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
HISTORICAL FINANCIAL RATIOS
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(ACTUAL)

SCHEDULE 2-E(N)

RATIO NO.	FINANCIAL RATIOS ITEM	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1966-75 AVERAGE
		HISTORICAL FINANCIAL RATIOS										
(1)	WORKING CAPITAL (THOUSANDS OF DOLLARS)	186[illegible]7	159490	124362	106133	87568	86983	111495	153937	241987	292980	155104
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	50	42	31	25	19	18	23	29	40	46	32
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS) .	77.[illegible]2%	81.59%	81.28%	82.40%	84.27%	84.79%	83.27%	82.94%	80.24%	85.28%	82.30%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS) .	73.59%	76.65%	76.54%	77.44%	79.45%	79.81%	78.42%	78.32%	75.67%	80.48%	77.66%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	3.48	2.36	2.52	2.29	1.96	1.69	2.09	2.30	3.78	2.27	2.47
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	NA	NA	NA	NA	NA	NA	NA	0.503	0.597	0.564	0.552
(7)	CASH FLOW (THOUSANDS OF DOLLARS)	332316	268409	279161	263519	226599	146069	192365	278433	374390	242204	260348
(8)	THROW-OFF TO DEBT RATIO	3.[illegible]1	2.41	2.00	1.47	1.56	1.04	1.18	2.16	3.06	1.74	1.96
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	13.[illegible]3%	7.71%	8.22%	6.80%	5.05%	3.73%	5.66%	6.04%	11.34%	5.24%	7.28%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.17	1.23	1.02	0.89	1.02	1.08	0.95	1.20	1.28	1.15	1.09
(11)	CAPITAL STRUCTURE RATIO	44.29%	45.86%	45.04%	46.11%	45.06%	45.04%	44.05%	43.26%	45.28%	46.23%	45.02%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	NA	NA	NA	NA	NA	NA	NA	3.43%	3.23%	1.89%	2.85%
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	5.94%	4.46%	4.50%	4.00%	3.44%	1.95%	2.67%	4.29%	6.42%	3.89%	4.15%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	7.36%	4.78%	4.97%	4.01%	2.62%	-0.25%	1.06%	3.95%	7.55%	3.04%	3.91%
(15)	DIVIDEND PAYOUT RATIO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
(16)	OPERATING INCOME PROFIT MARGIN	13.15%	9.69%	9.40%	8.82%	7.05%	6.67%	7.73%	6.82%	5.51%	3.36%	7.82%

SCHEDULE 3-B(H)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
HISTORICAL INCOME STATEMENT
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

LINE NO.	INCOME STATEMENT ITEM	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
					HISTORICAL INCOME STATEMENT						
1.	RAILWAY OPERATING REVENUES	1633906	1642998	1737613	1903488	2026168	2157256	2301406	2513125	2880417	2730737
2.	OPERATING EXPENSES	1221461	1256034	1327260	1442544	1535033	1619785	1716439	1866612	2151529	2094799
3.	NET REVENUE FROM RAILWAY OPERATIONS	412445	386964	410353	460944	491134	537471	584967	646513	728888	635938
4.	TOTAL TAX ACCRUALS	145534	139337	145867	181417	178473	181590	194770	216880	290661	258297
5.	PROVISIONS FOR DEFERRED TAXES ...	0	0	0	0	0	0	0	0	53207	17024
6.	RAILWAY OPERATING INCOME	266910	247627	264485	279527	312661	355881	390197	429633	385020	360617
7.	NET RENTS	-81304	-82059	-98601	-93657	-106023	-119469	-131433	-159872	-142565	-144112
8.	NET RAILWAY OPERATING INCOME	185606	165568	165884	185869	206637	236411	258763	269760	245454	216505
9.	OTHER INCOME	46855	56508	56165	67149	80434	88672	85791	104054	218503	149052
10.	TOTAL INCOME	232461	222076	222049	253019	287071	325083	344554	373814	463957	365557
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	11759	11323	15664	17788	20496	31745	18558	19136	22776	18944
12.	INCOME AVAILABLE FOR FIXED CHARGES	220701	210753	206385	235231	266575	293338	325996	354678	441181	346613
13.	RENT FOR LEASED ROADS & EQUIPMENT	10656	10560	11117	10587	11325	12482	11726	12056	12975	13138
14.	INTEREST ON FUNDED DEBT	66962	73106	77169	84865	97106	101164	105140	117161	132431	141996
15.	INTEREST ON UNFUNDED DEBT	170	437	394	349	705	734	906	285	1017	2209
16.	TOTAL FIXED CHARGES*	77717	84103	88680	95801	109136	114380	117772	129502	146423	157335
17.	ORDINARY INCOME	142984	126650	117705	139429	157438	178957	208224	225176	294758	189278
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	4771	2288	-1190	0	-60937	228	0	12318	13820
19.	NET INCOME	142984	131421	119993	138238	157438	118020	208452	225176	307076	203098

*INCLUDES CONTINGENT INTEREST AND AMORTIZATION
OF DISCOUNT ON FUNDED DEBT

SCHEDULE 3-C(M)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
HISTORICAL FUNDS FLOW
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

FUNDS FLOW ITEM	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
				HISTORICAL FUNDS FLOW						
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	142986	131421	119945	132238	159436	118020	208452	225176	307076	203098
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY DEPRECIATION	23436	23813	24395	25333	26050	26597	27579	28296	29295	29742
EQUIPMENT DEPRECIATION	99996	106590	110120	112715	118650	122385	126934	124974	125160	132174
ROAD PROPERTY RETIREMENTS	3516	2514	2997	4143	3610	5385	4938	4069	2328	4554
EQUIPMENT RETIREMENTS	-1084	-5293	-2519	-2464	-2206	-717	-668	-758	-806	-715
TOTAL DEPRECIATION AND RETIREMENTS	125864	127624	134933	139727	145504	153650	158783	156581	155977	165755
INCREASES/DECREASES (-) TO ALL RESERVES	466	32	3635	47174	-1393	-4355	10712	-15600	-11232	-2221
INTEREST IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DEFERRED FEDERAL INCOME TAX	0	0	0	0	0	0	0	0	50207	17024
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	78871	34450
TOTAL FUNDS FROM OPERATIONS	269314	259077	258564	325139	303549	267335	377947	366157	423157	349206
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	2	0	0	0	26395	0	22011	0	56209	22435
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	0	10509	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	0	0	961	0	783	0	0	156	3916	0
DECREASE IN MISCELLANEOUS ASSETS	2671	18068	0	20882	0	0	0	18769	3151	2579
INCREASE IN FUNDED DEBT	0	8402	12421	4681	0	0	0	22955	31983	0
INCREASE IN EQUIPMENT OBLIGATIONS	134306	17210	33608	60312	77007	98804	20280	118084	41254	72645
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN AMOUNT PAYABLE TO AFFILIATED COMPANIES	3243	3349	5549	3577	1676	8269	0	2204	0	16963
INCREASE IN OTHER LIABILITIES	0	0	228	9266	14675	25052	3136	0	532908	0
SALE OF CAPITAL STOCK	1153	0	3116	18207	12347	0	0	507	0	0
INCREASE IN CAPITAL SURPLUS	6946	22007	3497	15313	21979	204703	209493	466	41468	2314
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	5523	0	1651	6662	0	0	0	0
TOTAL SOURCES OF FUNDS	417635	328153	321497	457377	460262	610225	643374	529298	1132046	466142

NOTE: SOURCE AND APPLICATION TOTALS NOT EQUAL DUE TO ROUNDING.

SCHEDULE 3-B(H)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
HISTORICAL FUNDS FLOW
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

FUNDS FLOW ITEM	HISTORICAL FUNDS FLOW 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	71650	72052	74095	77183	79568	93568	120661	85621	113100	99593
INCREASE IN WORKING CAPITAL	0	1410	20516	45654	0	9405	0	107897	0	0
INCREASE IN INVESTMENT IN SECURITIES	12024	15322	4652	35412	33243	151959	0	11985	355829	18021
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	331113	217843	185701	296681	308757	319010	124063	315063	454609	285873
INCREASE IN MISCELLANEOUS PROPERTY	3663	1261	0	2334	0	2976	307	0	0	4796
INCREASE IN MISCELLANEOUS ASSETS ..	0	0	36131	0	812	1112	83703	0	0	0
DECREASE IN FUNDED DEBT	17206	0	0	0	57882	10131	36018	0	0	26965
DECREASE IN EQUIPMENT OBLIGATIONS .	0	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN AMOUNT PAYABLE TO AFFILIATED COMPANIES	0	0	0	0	0	0	421	0	5917	0
DECREASE IN OTHER LIABILITIES	2056	1167	0	0	0	0	0	8275	0	27201
REPURCHASE OF CAPITAL STOCK	0	19041	0	0	0	22062	194915	0	2576	1312
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	1122	38	0	315	0	0	83287	458	202015	2383
TOTAL APPLICATIONS OF FUNDS	438854	328154	321456	457379	460262	610223	643375	529299	1132046	466142

NOTES: SOURCE AND APPLICATION TOTALS NOT EQUAL DUE TO ROUNDING.

1974 INCREASE IN MISCELLANEOUS DEBITS TO RETAINED INCOME DUE PRIMARILY TO UNIFORM SYSTEM OF ACCOUNT CHANGES INCLUDING THE EQUITY BASIS OF ACCOUNTING FOR SECURITY INVESTMENTS AND THE DEFERRED METHOD OF INTERPERIOD INCOME TAX ALLOCATION.

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-A(W)
HISTORICAL BALANCE SHEET
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

LINE NO.	BALANCE SHEET ITEM	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
					HISTORICAL BALANCE SHEET						
1.	CURRENT ASSETS	1547384	1449253	1456165	1485802	1629870	1628348	1641652	1722601	1866136	1924810
2.	SPECIAL FUNDS	97574	59007	68794	73659	113343	139141	171121	135906	195527	168009
3.	INVESTMENTS	1066914	1067682	1075185	1099994	982726	732641	675218	693688	1356225	1387416
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	15433779	15836684	15975021	16214337	16488907	16321253	15825522	16166468	16750203	17405348
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-4098507	-4224715	-4249423	-4464736	-4576842	-4565337	-4184473	-4288678	-4441897	-4649364
6.	TOTAL TRANSPORTATION PROPERTY (NET)	11335270	11611968	11725597	11749601	11912064	11755916	11641048	11877789	12308305	12755984
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	293054	308593	342772	373381	413695	305469	307544	313619	217092	235797
8.	OTHER ASSETS & DEFERRED CHARGES	106262	105863	106825	133251	148616	201556	204528	185700	147217	155198
9.	TOTAL ASSETS	14446459	14602366	14795341	14915689	15200313	14763068	14641110	14929303	16090522	16627214
10.	CURRENT LIABILITIES	971821	961313	1029651	1187116	1276305	1317853	1293959	1350782	1502892	1526626
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	199793	209702	242543	227190	219676	245227	244149	247580	262254	377985
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	2466266	2424597	2348937	2351463	2459821	2306379	2317025	2216621	2188364	2134613
13.	EQUIPMENT OBLIGATIONS	1322799	1449813	1465579	1502459	1604796	1656614	1794940	1827681	1951532	2219206
14.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
15.	DEBT IN DEFAULT	0	0	0	0	0	0	0	0	2340	2340
16.	AMOUNTS PAYABLE TO AFFILIATED COMPANIES	100958	108227	112262	134939	192252	190347	193650	202293	226476	203712
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES	134396	109673	109665	122691	149747	259424	239074	250469	258409	233788
18.	OTHER LIABILITIES AND DEFERRED CREDITS	188866	163998	160465	186512	203513	232370	211263	225228	1935351	2016623
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	2916409	2930397	2983113	2984767	2721503	2672372	2388179	2387925	2387383	2390736
20.	CAPITAL SURPLUS	361872	383617	361293	366052	492545	486481	463286	463327	469746	468957
21.	RETAINED INCOME-BEGINNING YEAR	5519293	5784679	5861036	5981632	5852480	5880156	5395941	5495585	5757397	4902775
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS	463552	360863	390867	124664	292901	116534	378354	490769	-473114	360049
23.	MINUS CASH DIVIDENDS	198166	284504	270073	254016	265225	600749	278710	228957	381508	210196
24.	RETAINED INCOME-END OF YEAR	5784679	5861036	5981632	5852480	5880156	5395941	5495585	5757397	4902775	5052628
25.	TOTAL SHAREHOLDERS EQUITY	9662960	9175042	9326238	9203299	9094204	8554794	8347050	8608649	7759904	7912321
26.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	14446459	14602366	14795341	14915689	15200313	14763068	14641110	14929303	16090522	16627214

SCHEDULE 3-E(B)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
HISTORICAL FINANCIAL RATIOS
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(ACTUAL)

RATIO NO.	FINANCIAL RATIOS ITEM	HISTORICAL FINANCIAL RATIOS 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1966-75 AVERAGE
(1)	WORKING CAPITAL (THOUSANDS OF DOLLARS)	123876	124580	135742	169026	178656	170160	163857	206801	233644	195322	185676
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	40	39	40	46	46	41	37	43	42	36	44
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS) .	79.72%	81.44%	82.06%	80.70%	80.89%	80.62%	80.29%	80.64%	79.64%	81.99%	80.80%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS) .	74.76%	76.45%	76.38%	75.78%	75.76%	75.09%	74.58%	74.27%	74.70%	76.71%	75.45%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	3.20	2.69	2.49	2.90	2.73	2.78	3.02	2.93	3.60	2.39	2.87
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	NA	NA	NA	NA	NA	NA	NA	0.515	0.565	0.516	0.532
(7)	CASH FLOW (THOUSANDS OF DOLLARS)	266868	259045	254926	277965	304942	271670	367235	381757	463053	368853	347866
(8)	THROW-OFF TO DEBT RATIO	2.57	2.58	2.21	2.18	2.14	1.66	2.61	2.17	2.77	2.22	2.31
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	10.47%	8.63%	7.61%	9.54%	9.31%	9.44%	10.34%	9.95%	13.21%	7.99%	9.65%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.18	1.30	1.17	1.08	1.02	0.91	1.10	0.87	0.92	0.97	1.05
(11)	CAPITAL STRUCTURE RATIO	37.23%	37.13%	37.33%	37.49%	37.13%	36.79%	36.47%	37.18%	37.74%	37.74%	37.22%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	NA	NA	NA	NA	NA	NA	NA	5.53%	4.82%	4.09%	4.81%
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	4.74%	4.48%	4.22%	4.64%	5.17%	4.22%	5.86%	6.22%	7.73%	5.96%	5.32%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	5.10%	4.57%	4.09%	4.59%	5.11%	3.60%	6.13%	6.48%	8.62%	5.60%	5.39%
(15)	DIVIDEND PAYOUT RATIO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
(16)	OPERATING INCOME PROFIT MARGIN	11.37%	10.08%	9.55%	9.76%	10.30%	10.96%	11.24%	10.73%	8.52%	7.93%	10.04%

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-B(W)
HISTORICAL INCOME STATEMENT
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

LINE NO.	INCOME STATEMENT ITEM	HISTORICAL INCOME STATEMENT									
		1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
1.	RAILWAY OPERATING REVENUES	4600469	4436997	4656337	4943503	5174121	5589680	6019909	6734179	7692631	7544458
2.	OPERATING EXPENSES	3481534	3494676	3657227	3885651	4067791	4328766	4682642	5224044	5945149	5963640
3.	NET REVENUE FROM RAILWAY OPERATIONS	1118936	942321	999110	1057852	1106330	1260914	1337267	1510135	1747482	1580818
4.	TOTAL TAX ACCRUALS	466464	418050	431420	474556	469914	503975	522994	621708	810930	733889
5.	PROVISIONS FOR DEFERRED TAXES ...	0	0	0	0	0	0	0	0	96492	59790
6.	RAILWAY OPERATING INCOME	652471	524271	567690	583296	636416	756939	814273	888427	840060	787139
7.	NET RENTS	-175631	-172698	-187682	-224550	-242349	-261202	-278485	-341087	-342358	-395659
8.	NET RAILWAY OPERATING INCOME	476840	351572	380007	358745	394066	495737	535787	547339	497701	391480
9.	OTHER INCOME	197114	214316	240036	238411	249100	203265	183791	210616	290922	268713
10.	TOTAL INCOME	673953	565888	620043	597156	643166	699002	719578	757955	788623	660193
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	34959	40358	46520	48807	71053	55592	38777	36464	31498	44039
12.	INCOME AVAILABLE FOR FIXED CHARGES	639025	525530	573523	548349	572113	643410	680802	721491	757125	616154
13.	RENT FOR LEASED ROADS & EQUIPMENT	765	849	762	702	2267	1776	1756	1768	1616	1681
14.	INTEREST ON FUNDED DEBT	157106	172719	178026	181356	196341	209370	216878	225517	242252	274922
15.	INTEREST ON UNFUNDED DEBT	184	516	533	1165	12165	8047	7049	5083	2511	8010
16.	TOTAL FIXED CHARGES*	158055	174084	179321	183225	210773	219193	225683	232368	246379	284613
17.	ORDINARY INCOME	480969	351446	394202	365124	361340	424217	455118	489123	510746	331541
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	33108	1579	-27137	-16079	-269076	5686	3904	-956	4212
19.	NET INCOME	480969	384554	395781	337987	345260	155140	460804	493027	509789	335753

*INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-C(W)
HISTORICAL FUNDS FLOW
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

FUNDS FLOW ITEM	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	480969	384554	395781	337987	345260	155140	460804	493027	509789	335753
ADD:										
NON-CASH CHANGES FOR:										
ROAD PROPERTY DEPRECIATION	64951	65830	57265	68702	71208	71824	70533	68863	72094	79434
EQUIPMENT DEPRECIATION	265674	280793	284993	290485	301557	302280	302184	306560	315906	334800
ROAD PROPERTY RETIREMENTS	10196	7029	8730	11536	12250	13499	24328	12216	9331	6829
EQUIPMENT RETIREMENTS	-794	-3125	-5403	-2670	-2882	-2355	-1521	-1515	-2721	-2319
TOTAL DEPRECIATION AND RETIREMENTS	340027	350527	357515	368055	382133	385248	395524	386124	394610	418744
INCREASES/DECREASES (-) TO ALL RESERVES	-786	-24723	-8	13626	27056	109737	-20410	11395	7940	-24621
INTEREST IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DEFERRED FEDERAL INCOME TAX	0	0	0	0	0	0	0	0	96492	59790
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	71372	9528
TOTAL FUNDS FROM OPERATIONS	820210	710358	753359	719668	754449	650125	835918	890546	937459	780138
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	87623	61429	127829	0	43070	0	0	8575	0
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	117268	250085	57423	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	9676	0	0	0	0	108226	0	0	96527	0
DECREASE IN MISCELLANEOUS ASSETS	0	38966	0	0	0	0	0	54043	0	19557
INCREASE IN FUNDED DEBT	0	0	0	2566	108338	0	10646	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS	307505	136923	45607	21527	94823	77369	137248	36172	138525	383405
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	2340	0
INCREASE IN AMOUNT PAYABLE TO AFFILIATED COMPANIES	0	7269	4035	22677	57313	0	3303	8643	24183	0
INCREASE IN OTHER LIABILITIES	18409	0	0	26047	17001	28857	0	13965	1616631	18482
SALE OF CAPITAL STOCK	7211	13988	52715	1654	0	0	0	0	0	3353
INCREASE IN CAPITAL SURPLUS	2736	21735	0	4759	126493	0	0	41	6419	0
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	24296
TOTAL SOURCES OF FUNDS	1165747	1016862	920142	926107	1275685	1157732	1044538	1003410	2830659	1229231

NOTE: SOURCE AND APPLICATION TOTALS NOT EQUAL DUE TO ROUNDING.

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-E(H)
HISTORICAL FINANCIAL RATIOS
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(ACTUAL)

RATIO NO.	FINANCIAL RATIOS ITEM	1966	1967	1968	1969	HISTORICAL FINANCIAL RATIOS 1970	1971	1972	1973	1974	1975	1966-75 AVERAGE
(1)	WORKING CAPITAL (THOUSANDS OF DOLLARS)	575562	531751	457227	362601	326126	332030	329094	359756	367531	380714	420806
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	65	60	49	37	31	30	27	26	23	24	41
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS) .	79.49%	82.65%	82.57%	83.14%	83.30%	82.12%	82.41%	82.64%	81.73%	84.29%	82.44%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS) .	75.68%	78.76%	78.54%	78.60%	78.62%	77.44%	77.79%	77.58%	77.28%	79.05%	77.93%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	4.61	3.25	3.42	3.36	2.89	3.25	3.27	3.38	3.88	2.48	3.38
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	NA	NA	NA	NA	NA	NA	NA	0.580	0.658	0.606	0.615
(7)	CASH FLOW (THOUSANDS OF DOLLARS)	820996	735081	753367	706042	727393	540388	856328	879151	904399	754497	802550
(8)	THROW-OFF TO DEBT RATIO	4.11	3.51	3.11	3.11	3.31	2.20	3.51	3.55	3.45	2.00	3.18
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	12.41%	8.81%	9.32%	8.73%	7.72%	8.84%	8.51%	8.23%	9.21%	5.58%	8.73%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.65	1.65	1.45	1.58	1.70	1.53	1.53	1.52	1.48	1.10	1.52
(11)	CAPITAL STRUCTURE RATIO	31.13%	31.36%	30.89%	31.42%	32.99%	33.96%	35.28%	34.30%	37.37%	38.43%	33.71%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	NA	NA	NA	NA	NA	NA	NA	4.71%	4.26%	3.14%	4.04%
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	4.94%	4.21%	4.28%	3.87%	4.10%	2.81%	5.30%	5.56%	5.92%	4.90%	4.59%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	5.39%	4.22%	4.28%	3.65%	3.77%	1.76%	5.45%	5.82%	6.23%	4.28%	4.48%
(15)	DIVIDEND PAYOUT RATIO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
(16)	OPERATING INCOME PROFIT MARGIN	10.37%	7.92%	8.16%	7.26%	7.62%	8.87%	8.90%	8.13%	6.47%	5.19%	7.89%

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-B(W)
HISTORICAL FUNDS FLOW
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

FUNDS FLOW ITEM	HISTORICAL FUNDS FLOW 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	198166	284504	270073	254016	265225	600749	278710	228957	381508	210196
INCREASE IN WORKING CAPITAL	1	0	0	0	54879	0	37198	24126	0	34940
INCREASE IN INVESTMENT IN SECURITIES	49852	768	7506	24808	0	0	0	18470	591165	21663
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	831913	627225	471215	392059	544596	229098	280658	622865	825126	866423
INCREASE IN MISCELLANEOUS PROPERTY	0	15539	34179	30609	40314	0	2075	6075	0	18705
INCREASE IN MISCELLANEOUS ASSETS ..	13534	0	30753	11290	55049	78738	34952	0	21158	0
DECREASE IN FUNDED DEBT	55505	42269	75663	0	0	153442	0	100404	28257	53751
DECREASE IN EQUIPMENT OBLIGATIONS .	0	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN AMOUNT PAYABLE TO AFFILIATED COMPANIES	64573	0	0	0	0	1905	0	0	0	22764
DECREASE IN OTHER LIABILITIES	0	22868	3533	0	0	0	21107	0	0	0
REPURCHASE OF CAPITAL STOCK	0	0	0	0	263264	49131	284193	254	542	0
DECREASE IN CAPITAL SURPLUS	0	0	22316	0	0	6064	23195	0	0	789
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	17617	23691	4916	213323	52359	38606	82450	2258	982903	0
TOTAL APPLICATIONS OF FUNDS	1230961	1016864	920142	926105	1275686	1157733	1044538	1003409	2830659	1229231

NOTES: SOURCE AND APPLICATION TOTALS NOT EQUAL DUE TO ROUNDING.

1974 INCREASE IN MISCELLANEOUS DEBITS TO RETAINED INCOME DUE PRIMARILY TO UNIFORM SYSTEM OF ACCOUNT CHANGES INCLUDING THE EQUITY BASIS OF ACCOUNTING FOR SECURITY INVESTMENTS AND THE DEFERRED METHOD OF INTERPERIOD INCOME TAX ALLOCATION.

SCHEDULE 1-A(R)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
HISTORICAL BALANCE SHEET
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

LINE NO.	BALANCE SHEET ITEM	HISTORICAL BALANCE SHEET 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
1.	CURRENT ASSETS	2677452	2527012	2584614	2737647	2913271	2961646	3019841	3413995	3843984	3909090
2.	SPECIAL FUNDS	167295	102811	152320	123026	164141	175856	244364	199099	294855	276093
3.	INVESTMENTS	2147634	2172365	2298793	2368420	2362057	2219160	2063688	2086482	3413051	3498896
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	26688034	27419166	27671937	28199200	28859706	28969630	28419309	28981902	29975785	31162477
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-7101402	-7293212	-7373795	-7649153	-7877395	-7956326	-7572289	-7768918	-8059123	-8436695
6.	TOTAL TRANSPORTATION PROPERTY (NET)	19586629	20125948	20298139	20550043	20982310	21013299	20847018	21212981	21916659	22725782
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	431261	451535	484985	517129	556736	453093	454751	459520	356658	382898
8.	OTHER ASSETS & DEFERRED CHARGES .	156615	201703	201708	242432	257527	325071	379613	373729	298988	312549
9.	TOTAL ASSETS	25206868	25581375	26020559	26538697	27236042	27148165	27009476	27745806	30124195	31105308
10.	CURRENT LIABILITIES	1751927	1780895	1896027	2150715	2315506	2381065	2391529	2601319	2970334	3044707
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	414935	421563	497665	533666	507401	549912	547164	552626	551890	683255
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	4224588	4186088	4091935	4038818	4134468	3990318	3899395	3838900	3791459	3657069
13.	EQUIPMENT OBLIGATIONS	2818237	3071362	3094371	3187885	3394478	3515292	3637534	3703711	3815082	4286599
14.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
15.	DEBT IN DEFAULT	0	0	0	0	0	0	0	0	2340	2340
16.	AMOUNTS PAYABLE TO AFFILIATED COMPANIES....	540973	556819	603667	735781	783900	763074	776932	808940	857410	904560
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES ..	257063	228842	214699	276629	301668	432999	430567	441272	462208	464509
18.	OTHER LIABILITIES AND DEFERRED CREDITS	477793	464180	461725	455545	519201	585520	581131	612116	3654611	3719714
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	4880025	4878371	4976555	4989996	4759440	4686248	4205149	4145682	4139363	4052381
20.	CAPITAL SURPLUS	634754	675765	728677	748769	1070109	1356574	1618783	1746761	1893221	2026833
21.	RETAINED INCOME-BEGINNING YEAR..	8784337	9198582	9308946	9455457	9361133	9449871	8887164	8921291	9294479	7986277
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS....	412217	592195	606333	369223	526811	221074	528114	823575	-693701	712071
23.	MINUS CASH DIVIDENDS..............	497972	481829	459826	443547	458073	783781	493987	450387	614501	435007
24.	RETAINED INCOME-END OF YEAR......	9198582	9308946	9455457	9361133	9449871	8887164	8921291	9294479	7986277	8263341
25.	TOTAL SHAREHOLDERS EQUITY........	14701376	14863084	15160689	15119878	15279420	14929986	14745223	15186922	14018861	14342555
26.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY......	25206868	25581375	26020559	26538697	27236042	27148165	27009476	27745806	30124195	31105308

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL SCHEDULE I-B(H)

HISTORICAL INCOME STATEMENT

FOR THE YEARS ENDED DECEMBER 31, 1966-1975

(THOUSANDS OF DOLLARS-ACTUAL)

LINE NO.	INCOME STATEMENT ITEM				HISTORICAL INCOME STATEMENT						
		1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
1.	RAILWAY OPERATING REVENUES	8202503	8019436	8450655	8995270	9467350	10056088	10723390	11860836	13615743	13271906
2.	OPERATING EXPENSES	6151358	6241076	6558770	6991626	7404062	7791419	8282791	9137524	10399027	10470293
3.	NET REVENUE FROM RAILWAY OPERATIONS	2051145	1778359	1891885	2003644	2063287	2264669	2440599	2723312	3216716	2801613
4.	TOTAL TAX ACCRUALS	805352	726466	768858	844738	845216	882766	935228	1106313	1471387	1295009
5.	PROVISIONS FOR DEFERRED TAXES ...	0	0	0	0	0	0	0	0	210685	114525
6.	RAILWAY OPERATING INCOME	1245791	1051893	1123029	1158705	1218071	1381903	1505372	1616999	1534644	1392079
7.	NET RENTS	-324219	-346748	-383751	-424700	-455651	-495847	-525193	-621633	-623892	-683537
8.	NET RAILWAY OPERATING INCOME	921572	705143	739276	734005	762420	886054	980176	995363	910751	708542
9.	OTHER INCOME	301387	337288	362655	368944	401938	353385	324214	390429	677284	541218
10.	TOTAL INCOME	1222959	1042431	1101931	1102948	1164358	1239439	1304390	1385792	1588035	1249760
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	57357	64519	71562	77469	104446	108235	70674	77919	73741	71465
12.	INCOME AVAILABLE FOR FIXED CHARGES	1165602	977912	1030369	1025479	1059912	1131202	1233717	1307873	1514294	1178295
13.	RENT FOR LEASED ROADS & EQUIPMENT	29635	28373	29979	29304	24746	25700	25470	25223	25375	25770
14.	INTEREST ON FUNDED DEBT	309006	338665	347621	360586	397518	420647	430570	448934	483706	525172
15.	INTEREST ON UNFUNDED DEBT	707	1237	1407	2591	17413	12635	11613	9337	7772	14358
16.	TOTAL FIXED CHARGES*	339348	368075	379007	392481	439677	458982	467653	483494	516853	565300
17.	ORDINARY INCOME	826254	609837	651361	632996	620233	672220	766063	824379	997441	612995
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	39426	4805	-41895	-38666	-406451	-65105	12726	34925	8392
19.	NET INCOME	826254	649263	656165	591100	581566	265768	700958	837105	1032365	621387

*INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

SCHEDULE 1-C(H)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
HISTORICAL FUNDS FLOW
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

FUNDS FLOW ITEM				HISTORICAL FUNDS FLOW						
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	826254	649263	656168	591100	581566	265768	700958	837105	1032365	621387
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY DEPRECIATION	116145	117977	120625	123567	127283	128991	130000	130115	134972	143145
EQUIPMENT DEPRECIATION	467116	496156	508377	517293	538687	546260	552194	553773	564322	592762
ROAD PROPERTY RETIREMENTS	14843	11640	13027	23275	18898	21573	32404	21225	15554	12528
EQUIPMENT RETIREMENTS	-2198	-12501	-10721	-7709	-7500	-4465	372	-2877	-5371	-4268
TOTAL DEPRECIATION AND RETIREMENTS	595906	613272	631308	656426	677368	692359	714970	702236	709477	744167
INCREASES/DECREASES (-) TO ALL RESERVES	-2381	-28196	5857	61930	25039	131331	-2432	10705	20936	2301
INTEREST IN DEFAULT	0	0	977	0	0	0	0	0	0	0
DEFERRED FEDERAL INCOME TAX	0	0	0	0	0	0	0	0	213683	114525
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	214503	71933
TOTAL FUNDS FROM OPERATIONS	1419779	1234337	1294309	1309456	1283973	1089458	1413496	1550046	1758958	1410447
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	1	139409	57530	101655	0	17184	0	0	0	9267
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	6363	142857	155272	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	3532	0	0	0	0	103863	0	0	102862	0
DECREASE IN MISCELLANEOUS ASSETS	0	59396	0	0	0	0	0	51149	0	5201
INCREASE IN FUNDED DEBT	0	0	0	0	95650	0	0	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS	632962	259695	98651	129815	180548	163325	119496	71639	110635	602882
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	2360	0
INCREASE IN AMOUNT PAYABLE TO AFFILIATED COMPANIES	0	45846	16845	132114	48119	0	13858	32008	48470	47150
INCREASE IN OTHER LIABILITIES	28243	0	0	33820	23656	66319	0	30985	2831812	0
SALE OF CAPITAL STOCK	6241	10346	98424	13141	0	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	11902	40956	52912	20072	321360	286465	262209	127978	146460	133612
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	90484
TOTAL SOURCES OF FUNDS	2102660	1790022	1618735	1740073	1959669	1869291	1964329	1863805	5001537	2299243

NOTE: SOURCE AND APPLICATION TOTALS NOT EQUAL DUE TO ROUNDING.

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL — SCHEDULE 1-B(H)
HISTORICAL FUNDS FLOW
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(THOUSANDS OF DOLLARS-ACTUAL)

FUNDS FLOW ITEM	1966	1967	1968	1969	HISTORICAL FUNDS FLOW 1970	1971	1972	1973	1974	1975
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	397972	481829	459824	443547	458073	783781	493987	450387	614501	435007
INCREASE IN WORKING CAPITAL	0	0	0	0	10833	0	47731	184364	60974	0
INCREASE IN INVESTMENT IN SECURITIES	66149	24731	126428	69627	0	0	0	22594	1112066	13912
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	1518751	1152591	803498	908331	1109635	723348	548689	1068199	1413155	1553290
INCREASE IN MISCELLANEOUS PROPERTY	0	20294	33453	32144	39607	0	1658	4769	0	26240
INCREASE IN MISCELLANEOUS ASSETS ..	7906	0	49514	11428	56212	79299	123010	0	21015	0
DECREASE IN FUNDED DEBT	157802	39900	92755	53117	0	144150	90923	60495	47441	134390
DECREASE IN EQUIPMENT OBLIGATIONS .	0	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN AMOUNT PAYABLE TO AFFILIATED COMPANIES	62782	0	0	0	0	20826	0	0	0	0
DECREASE IN OTHER LIABILITIES	0	13615	3432	0	0	0	4389	0	0	49422
REPURCHASE OF CAPITAL STOCK	0	0	0	0	230556	73192	481099	59467	6319	86982
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	14037	57068	49835	221877	54755	44694	172844	13530	1726066	0
TOTAL APPLICATIONS OF FUNDS	2225399	1790026	1618732	1740071	1959671	1869290	1964330	1863805	5001537	2299243

NOTES: SOURCE AND APPLICATION TOTALS NOT EQUAL DUE TO ROUNDING.

1974 INCREASE IN MISCELLANEOUS DEBITS TO RETAINED INCOME DUE PRIMARILY TO UNIFORM SYSTEM OF ACCOUNT CHANGES INCLUDING THE EQUITY BASIS OF ACCOUNTING FOR SECURITY INVESTMENTS AND THE DEFERRED METHOD OF INTERPERIOD INCOME TAX ALLOCATION.

SCHEDULE 1-E(H)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
HISTORICAL FINANCIAL RATIOS
FOR THE YEARS ENDED DECEMBER 31, 1966-1975
(ACTUAL)

RATIO NO.	FINANCIAL RATIOS ITEM	1966	1967	1968	1969	HISTORICAL FINANCIAL RATIOS 1970	1971	1972	1973	1974	1975	1966-75 AVERAGE
(1)	WORKING CAPITAL (THOUSANDS OF DOLLARS)	885525	815821	717352	537759	592349	589173	604446	720494	843163	869017	769590
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	57	52	43	36	31	29	28	30	31	32	41
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS) .	78.95%	82.15%	82.15%	82.45%	83.02%	82.41%	82.14%	82.28%	80.96%	84.04%	82.05%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS) .	74.99%	77.62%	77.61%	77.73%	78.21%	77.48%	77.24%	77.04%	76.38%	78.89%	77.34%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	3.94	2.85	2.94	2.93	2.60	2.71	2.89	2.99	3.77	2.41	3.00
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	NA	NA	NA	NA	NA	NA	NA	0.547	0.620	0.576	0.581
(7)	CASH FLOW (THOUSANDS OF DOLLARS)	1422160	1262535	1287474	1247526	1256936	958127	1415928	1539361	1741842	1365556	1430197
(8)	THROW-OFF TO DEBT RATIO	3.63	2.99	2.59	2.34	2.48	1.74	2.59	2.79	3.16	2.00	2.61
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	12.17%	8.51%	8.70%	8.44%	7.42%	7.79%	8.26%	8.11%	10.53%	6.00%	8.59%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.41	1.46	1.26	1.20	1.31	1.23	1.25	1.24	1.27	1.08	1.27
(11)	CAPITAL STRUCTURE RATIO	35.24%	35.73%	35.36%	35.98%	36.66%	37.13%	37.54%	36.96%	39.15%	39.93%	36.96%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	NA	NA	NA	NA	NA	NA	NA	4.59%	4.15%	3.07%	3.94%
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	5.11%	4.31%	4.32%	4.05%	4.16%	2.92%	4.83%	5.43%	6.46%	4.95%	4.65%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	5.70%	4.39%	4.37%	3.90%	3.83%	1.76%	4.72%	5.50%	7.07%	4.38%	4.57%
(15)	DIVIDEND PAYOUT RATIO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
(16)	OPERATING INCOME PROFIT MARGIN	11.24%	8.79%	8.75%	8.16%	8.05%	8.81%	9.14%	8.39%	6.69%	5.34%	8.34%

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL SCHEDULE 2-A(C)
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	BALANCE SHEET ITEM	1976	1977	1978	1979	PROJECTED BALANCE SHEET 1980	1981	1982	1983	1984	1985
1.	CURRENT ASSETS	1252468	1341979	1369347	1399918	1483346	1542503	1566204	1581553	1484076	1494005
2.	SPECIAL FUNDS	32365	32769	33174	33578	33983	34387	34792	35196	35601	36005
3.	INVESTMENTS	1003370	1031325	1059280	1087235	1115190	1143145	1171100	1199055	1227010	1254965
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	7041784	7299388	7444744	7657324	7995944	8297005	8521034	8691567	8750917	8908736
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-1956471	-1986722	-2020274	-2060646	-2111175	-2170527	-2235345	-2303327	-2369882	-2439219
6.	TOTAL TRANSPORTATION PROPERTY (NET)	5085313	5312666	5424470	5596678	5884769	6126478	6285689	6388240	6381035	6469517
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	65654	65667	65680	65693	65706	65719	65732	65745	65758	65771
8.	OTHER ASSETS & DEFERRED CHARGES .	75286	78079	80872	83665	86458	89250	92043	94836	97629	100422
9.	TOTAL ASSETS	7514456	7762485	8032823	8266767	8669452	9001482	9215560	9364625	9291109	9420685
10.	CURRENT LIABILITIES	907586	972449	992261	1014434	1074889	1117756	1134931	1146053	1075418	1082613
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	163012	200961	174137	212405	193829	209190	203910	205895	205056	159789
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	689096	643600	623996	571305	549757	517813	494256	475288	456320	456320
13.	EQUIPMENT OBLIGATIONS	969000	1069051	1085226	1146177	1289242	1400836	1453682	1461628	1389271	1417722
14.	OTHER NON-CURRENT LIABILITIES	631254	649526	668380	687234	706874	726514	746154	765794	785434	805226
15.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
16.	DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES ..	162872	173682	184492	195301	206111	216921	227731	238541	249351	260160
18.	OTHER LIABILITIES AND DEFERRED CREDITS	1015026	1015026	1015026	1015026	1015026	1015026	1015026	1015026	1015026	1015026
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	1034116	1034116	1034116	1034116	1034116	1034116	1034116	1034116	1034116	1034116
20.	CAPITAL SURPLUS	870856	870856	870856	870856	870856	870856	870856	870856	870856	870856
21.	RETAINED INCOME-BEGINNING YEAR .	844860	1071638	1233218	1384313	1519913	1728752	1892454	2034898	2151428	2210261
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS....	353650	113992	118655	120447	135512	138517	131350	124037	79040	72059
23.	MINUS CASH DIVIDENDS.............	126872	130949	134781	138614	142447	146279	150111	153943	157776	161608
24.	PLUS SHORTFALL***	262974	178537	167221	153767	215774	171464	161205	146436	137569	198145
25.	RETAINED INCOME-END OF YEAR.....	1071638	1233218	1384313	1519913	1728752	1892454	2034898	2151428	2210261	2318857
26.	TOTAL SHAREHOLDERS EQUITY.........	2976610	3138190	3289285	3424885	3633724	3797426	3939870	4056400	4115233	4223829
27.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY......	7514456	7862485	8032823	8266767	8669452	9001482	9215560	9364625	9291109	9420685

*** SHORTFALLS ARE ADDED TO RETAINED INCOME SO THAT THEY WILL NOT BE CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN.,E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

SCHEDULE 2-B(C)

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED INCOME STATEMENT
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	INCOME STATEMENT ITEM	PROJECTED INCOME STATEMENT 1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	RAILWAY OPERATING REVENUES	3062687	3278035	3346978	3423657	3621841	3763058	3821655	3859480	3636487	3660584
2.	OPERATING EXPENSES	2452088	2573965	2617820	2670010	2788439	2882327	2932708	2972469	2869514	2898436
3.	NET REVENUE FROM RAILWAY OPERATIONS	610599	704070	729158	753647	833402	880731	888947	887011	766973	762148
4.	TOTAL TAX ACCRUALS	284259	314785	323310	329943	353494	365077	364495	362949	317127	314721
5.	PROVISIONS FOR DEFERRED TAXES ...	39544	49712	51746	52528	59098	60409	57283	54094	34470	31425
6.	RAILWAY OPERATING INCOME	286796	339573	354102	371176	420810	455245	467169	469968	415376	416002
7.	NET RENTS	-161091	-178029	-187334	-198990	-219542	-238096	-251650	-262291	-260906	-270056
8.	NET RAILWAY OPERATING INCOME	125705	161544	166768	172186	201268	217149	215519	207677	154470	145946
9.	OTHER INCOME	123733	126306	128879	131453	134026	136599	139172	141745	144318	146891
10.	TOTAL INCOME	249438	287850	295647	303639	335294	353748	354691	349422	298788	292837
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	8552	8776	9000	9224	9448	9672	9896	10120	10344	10568
12.	INCOME AVAILABLE FOR FIXED CHARGES	240886	279074	286647	294415	325846	344076	344795	339302	288444	282269
13.	RENT FOR LEASED ROADS & EQUIPMENT	10959	10959	10959	10959	10959	10959	10959	10959	10959	10959
14.	INTEREST ON FUNDED DEBT	135278	150150	153060	159036	175402	190627	198513	200333	194472	195278
15.	INTEREST ON UNFUNDED DEBT	3973	3973	3973	3973	3973	3973	3973	3973	3973	3973
16.	TOTAL FIXED CHARGES**	150210	165082	167992	173968	190334	205559	213445	215265	209404	210210
17.	ORDINARY INCOME	90676	113992	118655	120447	135512	138517	131350	124037	79040	72059
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	0	0	0	0	0	0	0	0	0
19.	NET INCOME	90676	113992	118655	120447	135512	138517	131350	124037	79040	72059

** INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL SCHEDULE 2-C(C)
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

FUNDS FLOW ITEM	PROJECTED FUNDS FLOW 1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	90676	113992	118655	120447	135512	138517	131350	124037	79040	72059
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY AND EQUIPMENT DEPRECIATION	183811	192953	197370	204557	216911	227660	235201	240507	241181	245917
ROAD PROPERTY AND EQUIPMENT RETIREMENTS	432	432	432	432	432	432	432	432	432	432
TOTAL DEPRECIATION AND RETIREMENTS	184243	193385	197802	204989	217343	228092	235633	240939	241613	246349
INCREASES/DECREASES (-) TO ALL RESERVES	-13733	10810	10810	10809	10810	10810	10810	10810	10810	10809
INTEREST IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DEFERRED FEDERAL INCOME TAX	39544	49712	51746	52528	59098	60409	57283	54094	34470	31425
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	0	0
TOTAL FUNDS FROM OPERATIONS	300730	367899	379013	388773	422763	437828	435076	429880	365933	360642
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	0	0	0	0	0	0	0	26842	0
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	159	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS ASSETS ..	20160	0	0	0	0	0	0	0	0	0
INCREASE IN FUNDED DEBT	0	0	0	0	0	0	0	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS .	131972	137940	0	99219	124489	126955	47566	9931	0	0
INCREASE IN OTHER NON-CURRENT LIABILITIES**	393	19792	19792	19792	19792	19792	19792	19792	19792	19792
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN OTHER LIABILITIES	0	0	0	0	0	0	0	0	0	0
SALE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF FUNDS	453414	525631	398805	507784	567044	584575	502434	459603	412567	380434

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

SCHEDULE 2-B(C)

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

FUNDS FLOW ITEM	1976	1977	1978	1979	PROJECTED FUNDS FLOW 1980	1981	1982	1983	1984	1985
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	126872	130949	134781	138614	142447	146279	150111	153943	157776	161608
INCREASE IN WORKING CAPITAL	62788	24648	7536	8418	22973	16290	6526	4227	0	2734
INCREASE IN INVESTMENT IN SECURITIES	27955	27955	27955	27955	27955	27955	27955	27955	27955	27955
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	414669	420738	309606	377197	505434	469801	394844	363490	234408	334831
INCREASE IN MISCELLANEOUS PROPERTY	0	13	15	13	13	13	13	13	13	13
INCREASE IN MISCELLANEOUS ASSETS ..	0	3197	3198	3197	3198	3196	3198	3197	3198	3197
DECREASE IN FUNDED DEBT	44560	46956	20602	53629	21700	32096	23709	19120	19120	0
DECREASE IN EQUIPMENT OBLIGATIONS .	0	0	10569	0	0	0	0	0	73196	16816
DECREASE IN OTHER NON-CURRENT LIABILITIES**	0	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER LIABILITIES	39544	49712	51746	52528	59098	60409	57283	54094	34470	31425
REPURCHASE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF FUNDS	716388	704168	566006	661551	782818	756039	663639	606039	550136	578579
NET DIFFERENCE (SHORTFALL)	262974	178537	167221	153767	215774	171464	161205	146436	137569	198145

NOTE: SHORTFALLS ARE NOT CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME
TYPE OF CORRECTIVE ACTION WILL BE TAKEN, E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL
EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS
AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

SCHEDULE 2-E(C)

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED FINANCIAL RATIOS
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(CONSTANT)

RATIO NO.	FINANCIAL RATIOS ITEM	1976	1977	1978	1979	PROJECTED FINANCIAL RATIOS 1980	1981	1982	1983	1984	1985	1976-85 AVERAGE
(1)	WORKING CAPITAL (MILLIONS OF DOLLARS)	313	357	373	381	397	417	428	433	422	410	402
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	49	54	55	55	55	56	57	57	57	55	55
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS) .	85.32%	83.95%	83.81%	83.80%	83.05%	82.92%	83.32%	83.81%	86.08%	86.56%	84.15%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS) .	80.06%	78.52%	78.21%	77.99%	76.99%	76.60%	76.74%	77.02%	78.91%	79.18%	77.79%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	2.03	2.18	2.20	2.18	2.21	2.15	2.05	1.98	1.64	1.58	2.02
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	0.45	0.50	0.49	0.49	0.50	0.50	0.49	0.49	0.46	0.46	0.49
(7)	CASH FLOW (MILLIONS OF DOLLARS)	275	307	316	325	353	367	367	365	321	318	337
(8)	THROW-OFF TO DEBT RATIO	1.69	1.55	1.82	1.53	1.82	1.75	1.80	1.77	1.56	1.99	1.73
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	5.14%	5.92%	6.04%	5.99%	6.37%	6.27%	5.86%	5.47%	3.70%	3.35%	5.44%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.13	0.96	1.13	0.96	1.12	1.09	1.15	1.17	1.18	1.56	1.14
(11)	CAPITAL STRUCTURE RATIO	45.17%	44.96%	43.69%	43.32%	42.99%	42.91%	42.38%	41.76%	40.80%	40.20%	42.55%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	1.96	2.45	2.45	2.48	2.79	2.89	2.79	2.64	1.96	1.84	2.48
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	4.36%	4.62%	4.76%	4.77%	5.07%	5.11%	4.95%	4.76%	3.99%	3.87%	4.68%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	3.17%	3.73%	3.69%	3.59%	3.84%	3.73%	3.40%	3.10%	1.93%	1.73%	3.19%
(15)	DIVIDEND PAYOUT RATIO	139.%	114.%	113.%	114.%	105.%	105.%	114.%	124.%	199.%	223.%	134.%
(16)	OPERATING INCOME PROFIT MARGIN	4.10%	4.93%	4.98%	5.03%	5.56%	5.77%	5.64%	5.38%	4.25%	3.99%	5.06%

SCHEDULE 2-F(C)

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL

% INCREASE IN REVENUE OR DECREASE IN EXPENSES
NEEDED TO ELIMINATE SHORTFALL OVER 9 YEARS

FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

	1977	1978	1979	1980	1981	1982	1983	1984	1985
PROJECTED DATA:									
TOTAL REVENUE	3278035	3346978	3423657	3621841	3763058	3821655	3859480	3636487	3660584
TOTAL EXPENSES	2573965	2617820	2670010	2788439	2882327	2932708	2972469	2869514	2898436
SHORTFALL	178537	167221	153767	215774	171464	161205	146436	137569	198145
INCREASED REVENUE OPTION:									
INCREASE REQUIRED = 4.7%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	178537	167221	153767	215774	171464	161205	146436	137569	198145
DECREASE IN SHORTFALL AFTER INCREASING REVENUE 4.7%	154751	158006	161626	170982	177649	180415	182201	171673	172811
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	23786	9215	-7859	44792	-6185	-19210	-35765	-34104	25334
DECREASED EXPENSE OPTION:									
DECREASE REQUIRED = 6.1%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	178537	167221	153767	215774	171464	161205	146436	137569	198145
DECREASE IN SHORTFALL AFTER DECREASING EXPENSES 6.1%	156253	158915	162083	169272	174972	178030	180444	174194	175950
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	22284	8306	-8316	46502	-3508	-16825	-34008	-36625	22195

NOTE: THE ABOVE CALCULATIONS ARE BASED ON A REVENUE INCREASE OR EXPENSE DECREASE EFFECTIVE JANUARY 1,1977

SCHEDULE 3-A(C)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	BALANCE SHEET ITEM	PROJECTED BALANCE SHEET									
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	CURRENT ASSETS	959723	1022274	1033509	1053963	1108374	1151195	1180836	1202862	1155009	1185996
2.	SPECIAL FUNDS	36857	37089	37321	37553	37785	38016	38250	38482	38714	38946
3.	INVESTMENTS	1170515	1204965	1239415	1273865	1308315	1342765	1377215	1411665	1446115	1480565
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	7520658	8107093	8501066	9047679	9825690	10565838	11207536	11779743	12141254	12767491
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-1584404	-1678237	-1781069	-1897793	-2037054	-2196976	-2373453	-2563570	-2759001	-2970327
6.	TOTAL TRANSPORTATION PROPERTY (NET)	5936254	6428856	6719997	7149886	7788636	8368862	8834083	9216173	9382253	9797164
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	81065	81583	82100	82618	83135	83652	84169	84687	85204	85721
8.	OTHER ASSETS & DEFERRED CHARGES	109834	117124	124414	131704	138994	146283	153573	160863	168153	175443
9.	TOTAL ASSETS	8294248	8891891	9236756	9729589	10465239	11130775	11668126	12114732	12275448	12763835
10.	CURRENT LIABILITIES	738249	786365	795067	810741	852596	885535	908336	925279	888469	912305
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	209874	222693	230049	270771	273164	296536	324005	343874	404938	301753
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	746652	730956	718560	680913	669378	657843	642331	630981	569846	569846
13.	EQUIPMENT OBLIGATIONS	1463680	1673658	1734366	1889022	2190018	2442175	2600692	2686140	2606723	2769665
14.	OTHER NON-CURRENT LIABILITIES	73035	75589	78817	82044	85272	88495	91743	94990	98238	101490
15.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
16.	DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES	78666	82524	86383	90241	94099	97958	101816	105675	109533	113391
18.	OTHER LIABILITIES AND DEFERRED CREDITS	688065	688065	688065	688065	688065	688065	688065	688065	688065	688065
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	627529	627529	627529	627529	627529	627529	627529	627529	627529	627529
20.	CAPITAL SURPLUS	687020	687020	687020	687020	687020	687020	687020	687020	687020	687020
21.	RETAINED INCOME-BEGINNING YEAR	2365853	2981478	3317492	3590960	3903243	4298098	4659619	4996589	5325179	5595087
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS	698112	121760	115380	107499	116317	110374	99556	87253	18973	17999
23.	MINUS CASH DIVIDENDS	82487	86825	88656	90487	92318	94151	95980	97810	99642	101473
24.	PLUS SHORTFALL***	609220	301079	246744	295271	370856	345298	333394	339147	350577	481158
25.	RETAINED INCOME-END OF YEAR	2981478	3317492	3590960	3903243	4298098	4659619	4996589	5325179	5595087	5992771
26.	TOTAL SHAREHOLDERS EQUITY	4296027	4632041	4905509	5217792	5612647	5974168	6311138	6639728	6909636	7307320
27.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	8294248	8891891	9236756	9729589	10465239	11130775	11668126	12114732	12275448	12763835

*** SHORTFALLS ARE ADDED TO RETAINED INCOME SO THAT THEY WILL NOT BE CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN, E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

SCHEDULE 3-B(C)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED INCOME STATEMENT
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	INCOME STATEMENT ITEM	PROJECTED INCOME STATEMENT									
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	RAILWAY OPERATING REVENUES	2957749	3168353	3207079	3271473	3442657	3570347	3658674	3725305	3555971	3657064
2.	OPERATING EXPENSES	2354961	2460730	2497020	2548679	2647384	2732168	2800616	2859725	2824478	2896714
3.	NET REVENUE FROM RAILWAY OPERATIONS	602788	707623	710059	722794	795273	838179	858058	865580	731493	760350
4.	TOTAL TAX ACCRUALS	229742	252704	251491	250199	259975	261414	259560	256533	219361	222885
5.	PROVISIONS FOR DEFERRED TAXES ...	23379	32023	30345	28272	30592	29028	26184	22948	4989	4733
6.	RAILWAY OPERATING INCOME	349667	422896	428223	444323	504706	547737	572314	586099	507143	532732
7.	NET RENTS	-190995	-207362	-212446	-221365	-241649	-260708	-276148	-290859	-286681	-304828
8.	NET RAILWAY OPERATING INCOME	158672	215534	215777	222958	263057	287029	296166	295240	220462	227904
9.	OTHER INCOME	151294	154651	158008	161365	164722	168079	171436	174793	178150	181507
10.	TOTAL INCOME	309966	370185	373785	384323	427779	455108	467602	470033	398612	409411
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	20025	20585	21144	21704	22263	22823	23382	23942	24501	25061
12.	INCOME AVAILABLE FOR FIXED CHARGES	289941	349600	352641	362619	405516	432285	444220	446091	374111	384350
13.	RENT FOR LEASED ROADS & EQUIPMENT	13130	13130	13130	13130	13130	13130	13130	13130	13130	13130
14.	INTEREST ON FUNDED DEBT	186890	213681	223102	240961	275040	307752	330505	344679	340979	352192
15.	INTEREST ON UNFUNDED DEBT	1029	1029	1029	1029	1029	1029	1029	1029	1029	1029
16.	TOTAL FIXED CHARGES**	201049	227840	237261	255120	289199	321911	344664	358838	355138	366351
17.	ORDINARY INCOME	88892	121760	115380	107499	116317	110374	99556	87253	18973	17999
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	0	0	0	0	0	0	0	0	0
19.	NET INCOME	88892	121760	115380	107499	116317	110374	99556	87253	18973	17999

** INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

SCHEDULE 3-C(C)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

FUNDS FLOW ITEM	1976	1977	1978	1979	PROJECTED FUNDS FLOW 1980	1981	1982	1983	1984	1985
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	88892	121760	115380	107499	116317	110374	99556	87253	18973	17999
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY AND EQUIPMENT DEPRECIATION	192722	212972	225520	244065	271682	297714	319816	339106	350035	371384
ROAD PROPERTY AND EQUIPMENT RETIREMENTS	1555	1555	1555	1555	1555	1555	1555	1555	1555	1555
TOTAL DEPRECIATION AND RETIREMENTS	194277	214527	227075	245620	273237	299269	321371	340661	351590	372939
INCREASES/DECREASES (-) TO ALL RESERVES	24550	3858	3859	3858	3858	3859	3858	3859	3858	3858
INTEREST IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DEFERRED FEDERAL INCOME TAX	23379	32023	30345	28272	30592	29028	26184	22948	4989	4733
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	0	0
TOTAL FUNDS FROM OPERATIONS	331098	372168	376659	385249	424004	442530	450969	454721	379410	399529
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	0	0	0	0	0	0	0	11043	0
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	223	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS ASSETS ..	0	0	0	0	0	0	0	0	0	0
INCREASE IN FUNDED DEBT	0	0	0	0	0	0	0	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS .	300931	222797	68064	195378	303389	275529	185986	105317	0	59757
INCREASE IN OTHER NON-CURRENT LIABILITIES**	0	3252	3253	3252	3253	3252	3253	3252	3253	3252
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN OTHER LIABILITIES	0	0	0	0	0	0	0	0	0	0
SALE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF FUNDS	632252	598217	447976	583879	730646	721311	640208	563290	393706	462538

* INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

SCHEDULE T-8(C)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

FUNDS FLOW ITEM	1976	1977	1978	PROJECTED FUNDS FLOW 1979	1980	1981	1982	1983	1984	1985
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	82487	86825	88656	90487	92318	94151	95980	97810	99642	101473
INCREASE IN WORKING CAPITAL	37369	14435	2593	4770	12556	9882	6840	5083	0	7151
INCREASE IN INVESTMENT IN SECURITIES	34450	34450	34450	34450	34450	34450	34450	34450	34450	34450
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	1015620	717129	518216	675509	911987	879495	786592	722751	517670	787850
INCREASE IN MISCELLANEOUS PROPERTY	0	518	517	516	517	517	517	518	517	517
INCREASE IN MISCELLANEOUS ASSETS ..	9067	7522	7522	7522	7522	7522	7522	7522	7522	7522
DECREASE IN FUNDED DEBT	36621	16394	12421	37672	11560	11564	15517	11355	61140	0
DECREASE IN EQUIPMENT OBLIGATIONS .	0	0	0	0	0	0	0	0	18353	0
DECREASE IN OTHER NON-CURRENT LIABILITIES**	2479	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER LIABILITIES	23379	32023	30345	28272	30592	29028	26184	22948	4989	4733
REPURCHASE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF FUNDS	1241472	909296	694720	879150	1101502	1066609	973602	902437	744283	943696
NET DIFFERENCE (SHORTFALL)	609220	301079	246744	295271	370856	345298	333394	339147	350577	481158

NOTE: SHORTFALLS ARE NOT CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN..E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED FINANCIAL RATIOS
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(CONSTANT)

SCHEDULE 3-E(C)

RATIO NO.	FINANCIAL RATIOS ITEM	1976	1977	1978	1979	PROJECTED FINANCIAL RATIOS 1980	1981	1982	1983	1984	1985	1976-85 AVERAGE
(1)	WORKING CAPITAL (MILLIONS OF DOLLARS)	203	229	237	241	250	261	269	275	272	270	256
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	33	36	37	37	37	38	39	39	39	38	37
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS) .	86.06%	84.21%	84.46%	84.67%	83.92%	83.83%	84.10%	84.57%	87.49%	87.54%	84.98%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS) .	79.62%	77.67%	77.86%	77.91%	76.90%	76.52%	76.55%	76.76%	79.43%	79.21%	77.65%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	1.62	1.75	1.68	1.59	1.57	1.48	1.41	1.34	1.08	1.07	1.46
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	0.43	0.46	0.44	0.43	0.42	0.41	0.39	0.38	0.36	0.36	0.41
(7)	CASH FLOW (MILLIONS OF DOLLARS)	283	336	342	353	390	410	421	428	371	391	382
(8)	THROW-OFF TO DEBT RATIO	1.35	1.51	1.49	1.30	1.43	1.38	1.30	1.24	0.92	1.30	1.32
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	4.23%	5.41%	5.06%	4.62%	4.75%	4.35%	3.83%	3.29%	0.75%	0.69%	3.64%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	0.92	0.96	0.98	0.98	0.99	1.00	0.99	0.99	0.86	1.23	0.99
(11)	CAPITAL STRUCTURE RATIO	36.72%	36.85%	36.02%	35.90%	36.44%	36.84%	36.70%	36.13%	34.75%	33.87%	35.95%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	2.32	3.16	2.99	2.94	3.24	3.28	3.19	3.04	2.21	2.22	2.92
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	4.36%	4.76%	4.53%	4.67%	4.62%	4.58%	4.44%	4.25%	3.44%	3.43%	4.28%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	2.23%	2.73%	2.42%	2.12%	2.15%	1.91%	1.62%	1.35%	0.28%	0.25%	1.65%
(15)	DIVIDEND PAYOUT RATIO	88.%	68.%	73.%	80.%	76.%	81.%	92.%	107.%	503.%	540.%	180.%
(16)	OPERATING INCOME PROFIT MARGIN	5.36%	6.80%	6.73%	6.82%	7.64%	8.04%	8.09%	7.93%	6.20%	6.23%	7.16%

SCHEDULE 3-F(C)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT

% INCREASE IN REVENUE OR DECREASE IN EXPENSES
NEEDED TO ELIMINATE SHORTFALL OVER 9 YEARS

FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

	1977	1978	1979	1980	1981	1982	1983	1984	1985
PROJECTED DATA:									
TOTAL REVENUE	3168353	3207629	3271473	3442657	3571347	3658674	3725305	3555971	3657064
TOTAL EXPENSES	2460730	2497620	2548679	2647384	2732168	2800616	2859725	2824478	2896714
SHORTFALL	301079	246744	295271	370856	345298	333394	339147	350577	481158
INCREASED REVENUE OPTION:									
INCREASE REQUIRED = 9.6% ****									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	301079	246744	295271	370856	345298	333394	339147	350577	481158
DECREASE IN SHORTFALL AFTER INCREASING REVENUE 9.6%	310533	314329	320640	337418	349933	358590	365121	348524	358432
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	-9454	-67585	-25369	33438	-4635	-25196	-25974	2053	122726
DECREASED EXPENSE OPTION:									
DECREASE REQUIRED =12.6% ****									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	301079	246744	295271	370856	345298	333394	339147	350577	481158
DECREASE IN SHORTFALL AFTER DECREASING EXPENSES12.6%	310641	315223	321744	334204	344908	353548	361010	356561	365680
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	-9562	-68479	-26473	36652	390	-20154	-21863	-5984	115478

NOTE: THE ABOVE CALCULATIONS ARE BASED ON A REVENUE INCREASE OR EXPENSE DECREASE EFFECTIVE JANUARY 1,1977

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-A(C)
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	BALANCE SHEET ITEM	1976	1977	1978	PROJECTED BALANCE SHEET 1979	1980	1981	1982	1983	1984	1985
1.	CURRENT ASSETS	2426667	2615715	2687470	2756404	2922436	3047464	3158904	3272145	3161243	3270945
2.	SPECIAL FUNDS	142022	143571	145120	146670	148219	149769	151318	152867	154417	155966
3.	INVESTMENTS	1396944	1406472	1416000	1425528	1435056	1444584	1454112	1463640	1473168	1482696
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	18547016	19680438	20352572	21245744	22554614	23825178	24952641	26029090	26667275	27806023
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-4640596	-4727191	-4837725	-4976732	-5157722	-5378247	-5632394	-5917270	-6216125	-6545830
6.	TOTAL TRANSPORTATION PROPERTY (NET)	13906420	14953247	15514847	16269012	17396692	18446931	19320247	20111820	20451148	21260193
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	265432	257847	250262	242677	235093	227507	219923	212338	204753	197169
8.	OTHER ASSETS & DEFERRED CHARGES .	197262	206071	214880	223689	232498	241307	250116	258925	267735	276544
9.	TOTAL ASSETS	18334747	19582923	20228579	21063980	22369994	23557562	24554620	25471735	25712464	26643513
10.	CURRENT LIABILITIES	1956990	2109648	2167315	2222907	2356804	2457633	2547504	2638827	2549390	2637859
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	371936	418956	434192	498363	576555	576371	613006	662152	683732	582173
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	2048747	2022275	1998826	1946267	1874359	1847784	1826969	1802103	1777994	1777994
13.	EQUIPMENT OBLIGATIONS	2803478	3317016	3456882	3722801	4237167	4674431	4956574	5150331	4996233	5292099
14.	OTHER NON-CURRENT LIABILITIES	306020	307744	316275	325532	335281	345691	358945	372300	385719	400719
15.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
16.	DEBT IN DEFAULT	2340	2340	2340	2340	2340	2340	2340	2340	2340	2340
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES ..	297405	318197	338989	359780	380572	401364	422156	442948	463740	484531
18.	OTHER LIABILITIES AND DEFERRED CREDITS	2016623	2016623	2016623	2016623	2016623	2016623	2016623	2016623	2016623	2016623
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	2390736	2390736	2390735	2390736	2390736	2390736	2390736	2390736	2390736	2390736
20.	CAPITAL SURPLUS	468957	468957	468957	468957	468957	468957	468957	468957	468957	468957
21.	RETAINED INCOME-BEGINNING YEAR .	5052628	5671513	6210631	6637442	7109674	7730600	8375632	8950810	9524418	9977000
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS....	881719	446901	461980	464575	481226	470231	456639	439430	373396	360942
23.	MINUS CASH DIVIDENDS.............	262834	238541	240095	241649	243203	244757	246311	247865	249419	250973
24.	PLUS SHORTFALL***	474054	330758	204926	249306	382903	419558	364850	382043	328605	502513
25.	RETAINED INCOME-END OF YEAR......	5671513	6210631	6637442	7109674	7730600	8375632	8950810	9524418	9977000	10589482
26.	TOTAL SHAREHOLDERS EQUITY.........	8531206	9070324	9497135	9969367	10590293	11235325	11810503	12384111	12836693	13449175
27.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY.......	18334747	19582923	20228579	21063980	22369994	23557562	24554620	25471735	25712464	26643513

*** SHORTFALLS ARE ADDED TO RETAINED INCOME SO THAT THEY WILL NOT BE CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN.,E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-B(C)
PROJECTED INCOME STATEMENT
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	INCOME STATEMENT ITEM	1976	1977	1978	PROJECTED INCOME STATEMENT 1979	1980	1981	1982	1983	1984	1985
1.	RAILWAY OPERATING REVENUES	8358464	9040157	9313728	9563784	10139740	10564125	10953273	11352633	10963828	11355450
2.	OPERATING EXPENSES	6531784	6987081	7166651	7335025	7722119	8026268	8312751	8611255	8388099	8671370
3.	NET REVENUE FROM RAILWAY OPERATIONS	1826680	2053076	2147077	2228759	2417621	2537857	2640522	2741378	2575729	2684080
4.	TOTAL TAX ACCRUALS	769888	826586	846575	857258	893231	905476	914839	922919	860137	869395
5.	PROVISIONS FOR DEFERRED TAXES ...	129521	141987	146777	147602	152892	149399	145080	139613	118633	114676
6.	RAILWAY OPERATING INCOME	927271	1084503	1153725	1223899	1371498	1482982	1580603	1678846	1596959	1700009
7.	NET RENTS	-376594	-432744	-465427	-501050	-571859	-640466	-712719	-795350	-786563	-874423
8.	NET RAILWAY OPERATING INCOME	550677	651759	688298	722849	799639	842516	867884	883496	810396	825586
9.	OTHER INCOME	277289	277604	277919	278234	278549	278864	279179	279494	279809	280124
10.	TOTAL INCOME	827966	929363	966217	1001083	1078188	1121380	1147063	1162990	1090205	1105710
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	46547	46601	46655	46709	46763	46817	46871	46925	46979	47033
12.	INCOME AVAILABLE FOR FIXED CHARGES	781419	882762	919562	954374	1031425	1074563	1100192	1116065	1043226	1058677
13.	RENT FOR LEASED ROADS & EQUIPMENT	1681	1681	1681	1681	1681	1681	1681	1681	1681	1681
14.	INTEREST ON FUNDED DEBT	365933	428040	449761	481978	542378	596511	635732	668814	662009	689914
15.	INTEREST ON UNFUNDED DEBT	6140	6140	6140	6140	6140	6140	6140	6140	6140	6140
16.	TOTAL FIXED CHARGES**	373754	435861	457582	489799	550199	604332	643553	676635	669830	697735
17.	ORDINARY INCOME	407665	446901	461980	464575	481226	470231	456639	439430	373396	360942
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	0	0	0	0	0	0	0	0	0
19.	NET INCOME	407665	446901	461980	464575	481226	470231	456639	439430	373396	360942

** INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-C(C)
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

FUNDS FLOW ITEM	1976	1977	1978	PROJECTED FUNDS FLOW 1979	1980	1981	1982	1983	1984	1985
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	467665	446961	461980	464575	481226	470231	456639	439430	373396	360942
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY AND EQUIPMENT DEPRECIATION	423825	459777	478597	505393	546977	586737	621225	653541	670029	704506
ROAD PROPERTY AND EQUIPMENT RETIREMENTS	9572	9572	9572	9572	9572	9572	9572	9572	9572	9572
TOTAL DEPRECIATION AND RETIREMENTS	433397	469349	488169	514965	556549	596309	630797	663113	679601	714078
INCREASES/DECREASES (-) TO ALL RESERVES	63617	20792	20792	20791	20792	20792	20792	20792	20792	20791
INTEREST IN DEFAULT	149	149	149	149	149	149	149	149	149	149
DEFERRED FEDERAL INCOME TAX	129521	141987	146777	147602	152892	149399	145080	139613	118633	114676
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	0	0
TOTAL FUNDS FROM OPERATIONS	1034349	1079178	1117867	1148082	1211608	1236880	1253457	1263097	1192571	1210636
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	0	0	0	0	0	0	0	21465	0
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	0	7585	7585	7585	7584	7586	7584	7585	7585	7584
DECREASE IN MISCELLANEOUS ASSETS	0	0	0	0	0	0	0	0	0	0
INCREASE IN FUNDED DEBT	0	0	0	0	0	0	0	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS	578225	560556	155102	330090	592558	437080	318778	242903	0	194307
INCREASE IN OTHER NON-CURRENT LIABILITIES**	44210	15000	15000	15000	15000	15000	15000	15000	15000	15000
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN OTHER LIABILITIES	0	0	0	0	0	0	0	0	0	0
SALE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF FUNDS	1656784	1662319	1295556	1500757	1826750	1696546	1594819	1528585	1236621	1427527

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-B(C)
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

FUNDS FLOW ITEM	1976	1977	1978	PROJECTED FUNDS FLOW 1979	1980	1981	1982	1983	1984	1985
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	262834	238541	240095	241649	243203	244757	246311	247865	249419	250973
INCREASE IN WORKING CAPITAL	71493	36590	13866	13342	32135	24199	21569	21918	0	21233
INCREASE IN INVESTMENT IN SECURITIES	9528	9528	9528	9528	9528	9528	9528	9528	9528	9528
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	1583833	1516176	1069769	1269130	1664229	1646548	1504113	1454686	1018929	1523123
INCREASE IN MISCELLANEOUS PROPERTY	29635	0	0	0	0	0	0	0	0	0
INCREASE IN MISCELLANEOUS ASSETS	16077	10358	10358	10359	10358	10359	10358	10358	10360	10358
DECREASE IN FUNDED DEBT	27768	39748	29516	58304	77159	31165	22561	26511	25690	0
DECREASE IN EQUIPMENT OBLIGATIONS	0	0	0	0	0	0	0	0	132518	0
DECREASE IN OTHER NON-CURRENT LIABILITIES**	0	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER LIABILITIES	129676	142136	146926	147751	153041	149548	145229	139762	118782	114825
REPURCHASE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF FUNDS	2130838	1993077	1500480	1750063	2209653	2116104	1959669	1910628	1565226	1930040
NET DIFFERENCE (SHORTFALL)	676056	330758	204926	249306	542903	619558	364850	382043	328605	502513

NOTE: SHORTFALLS ARE NOT CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN, E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-E(C)
PROJECTED FINANCIAL RATIOS
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(CONSTANT)

RATIO NO.	FINANCIAL RATIOS ITEM	1976	1977	1978	1979	PROJECTED FINANCIAL RATIOS 1980	1981	1982	1983	1984	1985	1976-85 AVERAGE
(1)	WORKING CAPITAL (MILLIONS OF DOLLARS)	454	488	513	527	550	578	601	622	623	622	569
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	25	26	27	27	27	27	28	28	29	28	27
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS)	82.65%	82.08%	81.94%	81.93%	81.80%	82.04%	82.40%	82.86%	83.68%	84.06%	82.53%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS)	78.15%	77.29%	76.95%	76.70%	76.16%	75.98%	75.89%	75.85%	76.51%	76.36%	76.41%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	2.60	2.50	2.48	2.39	2.28	2.14	2.04	1.95	1.82	1.76	2.15
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	0.51	0.56	0.54	0.54	0.54	0.53	0.52	0.52	0.49	0.49	0.53
(7)	CASH FLOW (MILLIONS OF DOLLARS)	841	916	950	980	1038	1067	1087	1103	1053	1075	1029
(8)	THROW-OFF TO DEBT RATIO	2.26	2.19	2.19	1.97	1.80	1.85	1.77	1.67	1.54	1.85	1.87
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	7.16%	7.24%	7.26%	7.11%	6.95%	6.52%	6.10%	5.67%	4.99%	4.65%	6.28%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.14	1.10	1.10	1.01	0.95	1.02	1.01	0.99	0.98	1.21	1.04
(11)	CAPITAL STRUCTURE RATIO	39.34%	40.09%	39.53%	39.45%	39.88%	39.86%	39.64%	39.21%	37.94%	37.46%	39.23%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	3.35	4.02	4.03	4.06	4.26	4.22	4.14	4.04	3.61	3.59	4.00
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	5.79%	6.03%	5.95%	5.92%	6.04%	5.91%	5.74%	5.58%	5.07%	5.01%	5.70%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	6.96%	5.08%	4.98%	4.77%	4.68%	4.31%	3.96%	3.63%	2.96%	2.75%	4.12%
(15)	DIVIDEND PAYOUT RATIO	61.%	51.%	49.%	49.%	48.%	49.%	51.%	54.%	63.%	66.%	53.%
(16)	OPERATING INCOME PROFIT MARGIN	6.59%	7.21%	7.39%	7.56%	7.89%	7.98%	7.92%	7.78%	7.39%	7.27%	7.60%

SCHEDULE 4-F(C)

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO.

% INCREASE IN REVENUE OR DECREASE IN EXPENSES
NEEDED TO ELIMINATE SHORTFALL OVER 9 YEARS

FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

	1977	1978	1979	1980	1981	1982	1983	1984	1985
PROJECTED DATA:									
TOTAL REVENUE	9040157	9313728	9563784	10139740	10564125	10953273	11352633	10963828	11355450
TOTAL EXPENSES	6967081	7166651	7335025	7722119	8026268	8312751	8611255	8388099	8671370
SHORTFALL	330756	204926	249306	382903	419558	364850	382043	328605	502513
INCREASED REVENUE OPTION:									
INCREASE REQUIRED = 3.4% ****									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	330756	204926	249306	382903	419558	364850	382043	328605	502513
DECREASE IN SHORTFALL AFTER INCREASING REVENUE 3.4%	306887	316174	324663	344215	358622	371832	385389	372190	385485
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	23871	-111248	-75357	38688	60936	-6982	-3346	-43585	117028
DECREASED EXPENSE OPTION:									
DECREASE REQUIRED = 4.4% ****									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	330758	204926	249306	382903	419558	364850	382043	328605	502513
DECREASE IN SHORTFALL AFTER DECREASING EXPENSES 4.4%	310546	318528	326011	343216	356734	369467	382734	372816	385406
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	20212	-113602	-76705	39687	62824	-4617	-691	-44211	117107

NOTE: THE ABOVE CALCULATIONS ARE BASED ON A REVENUE INCREASE OR EXPENSE DECREASE EFFECTIVE JANUARY 1,1977

SCHEDULE 1-A(C)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	BALANCE SHEET ITEM	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
					PROJECTED BALANCE SHEET						
1.	CURRENT ASSETS	4638858	4979968	5090326	5210285	5514156	5741162	5905944	6056560	5800328	5950946
2.	SPECIAL FUNDS	211244	213429	215615	217801	219987	222174	224360	226545	228732	230917
3.	INVESTMENTS	3570829	3642762	3714695	3786628	3858561	3930494	4002427	4074360	4146293	4218226
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	33109458	35086919	36298382	37950747	40376048	42688021	44681211	46500400	47559444	49482250
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-8181471	-8392150	-8639068	-8935171	-9365951	-9745750	-10241192	-10784167	-11345008	-11955376
6.	TOTAL TRANSPORTATION PROPERTY (NET)	24927987	26694769	27659314	29015576	31070097	32942271	34440019	35716233	36214436	37526874
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	412151	405097	398042	390988	383934	376878	369824	362770	355715	348661
8.	OTHER ASSETS & DEFERRED CHARGES .	382382	401274	420166	439058	457950	476840	495732	514624	533517	552409
9.	TOTAL ASSETS	34143451	36337299	37498158	39060336	41504685	43689819	45438306	46951092	47279021	48828033
10.	CURRENT LIABILITIES	3602825	3868262	3954663	4048082	4284289	4460924	4590771	4710159	4513277	4632777
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	744824	842550	838378	981539	1043548	1082097	1140921	1211921	1293726	1043715
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	3484495	3396891	3341324	3198485	3093494	3023440	2963556	2908372	2804160	2804160
13.	EQUIPMENT OBLIGATIONS	5236158	6059725	6276474	6758000	7716427	8517442	9010948	9298099	8992227	9479486
14.	OTHER NON-CURRENT LIABILITIES	1010309	1032859	1063472	1094810	1127427	1160760	1196842	1233084	1269391	1307435
15.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
16.	DEBT IN DEFAULT	2340	2340	2340	2340	2340	2340	2340	2340	2340	2340
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES ..	538963	574403	609864	645322	680782	716243	751703	787164	822624	858082
18.	OTHER LIABILITIES AND DEFERRED CREDITS	3719714	3719714	3719714	3719714	3719714	3719714	3719714	3719714	3719714	3719714
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	4052381	4052381	4052381	4052381	4052381	4052381	4052381	4052381	4052381	4052381
20.	CAPITAL SURPLUS	2026833	2026833	2026833	2026833	2026833	2026833	2026833	2026833	2026833	2026833
21.	RETAINED INCOME-BEGINNING YEAR .	6263341	9724629	10761341	11612715	12532830	13757450	14927705	15982297	17001025	17782348
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS....	1933681	882653	696015	692521	733055	719122	687545	650720	471409	451000
23.	MINUS CASH DIVIDENDS............	472193	656315	663532	470750	477966	485187	492402	499618	506837	514054
24.	PLUS SHORTFALL***	1346248	810374	818891	698344	969533	936320	859449	867626	816751	1181816
25.	RETAINED INCOME-END OF YEAR.....	9724629	10761341	11612715	12532830	13757450	14927705	15982297	17001025	17782348	18901110
26.	TOTAL SHAREHOLDERS EQUITY.........	15803843	16840555	17691929	18612044	19836664	21006919	22061511	23080239	23861562	24980324
27.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY......	34143451	36337299	37498158	39060336	41504685	43689819	45438306	46951092	47279021	48828033

*** SHORTFALLS ARE ADDED TO RETAINED INCOME SO THAT THEY WILL NOT BE CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN, E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

SCHEDULE 1-B(C)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED INCOME STATEMENT
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	INCOME STATEMENT ITEM				PROJECTED INCOME STATEMENT						
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	RAILWAY OPERATING REVENUES	14378880	15486545	15867785	16258914	17204238	17897530	18433602	18937418	18156286	18673098
2.	OPERATING EXPENSES	11338813	12021776	12281491	12553714	13157942	13640763	14046075	14443449	14082091	14466520
3.	NET REVENUE FROM RAILWAY OPERATIONS	3040067	3464769	3586294	3705200	4046296	4256767	4387527	4493969	4074195	4206578
4.	TOTAL TAX ACCRUALS	1283889	1394075	1421376	1437400	1506700	1531967	1538894	1542401	1396625	1407001
5.	PROVISIONS FOR DEFERRED TAXES ...	192444	223722	228868	228402	242582	238836	228547	216655	158092	150834
6.	RAILWAY OPERATING INCOME	1563734	1846972	1936050	2039398	2297014	2485964	2620086	2734913	2519478	2648743
7.	NET RENTS	-728680	-818135	-865207	-921405	-1033050	-1139270	-1240517	-1348500	-1334150	-1449307
8.	NET RAILWAY OPERATING INCOME	835054	1028837	1070843	1117993	1263964	1346694	1379569	1386413	1185328	1199436
9.	OTHER INCOME	552316	558561	564806	571052	577297	583542	589787	596032	602277	608522
10.	TOTAL INCOME	1387370	1587398	1635649	1689045	1841261	1930236	1969356	1982445	1787605	1807958
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	75124	75962	76799	77637	78474	79312	80149	80987	81824	82662
12.	INCOME AVAILABLE FOR FIXED CHARGES	1312246	1511436	1558850	1611408	1762787	1850924	1889207	1901458	1705781	1725296
13.	RENT FOR LEASED ROADS & EQUIPMENT	25770	25770	25770	25770	25770	25770	25770	25770	25770	25770
14.	INTEREST ON FUNDED DEBT	688101	791871	825923	881975	992820	1094890	1164750	1213826	1197460	1237384
15.	INTEREST ON UNFUNDED DEBT	11142	11142	11142	11142	11142	11142	11142	11142	11142	11142
16.	TOTAL FIXED CHARGES**	725013	828783	862835	918887	1029732	1131802	1201662	1250738	1234372	1274296
17.	ORDINARY INCOME	587233	682653	696015	692521	733055	719122	687545	650720	471409	451000
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	0	0	0	0	0	0	0	0	0
19.	NET INCOME	587233	682653	696015	692521	733055	719122	687545	650720	471409	451000

** INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

SCHEDULE 1-C(C)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

FUNDS FLOW ITEM				PROJECTED FUNDS FLOW						
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	587233	682653	696015	692521	733055	719122	687565	650720	471409	451000
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY AND EQUIPMENT DEPRECIATION	800358	865702	901487	954015	1035570	1112111	1176242	1233154	1261245	1321807
ROAD PROPERTY AND EQUIPMENT RETIREMENTS	11559	11559	11559	11559	11559	11559	11559	11559	11559	11559
TOTAL DEPRECIATION AND RETIREMENTS	811917	877261	913046	965574	1047129	1123670	1187801	1244713	1272804	1333366
INCREASES/DECREASES (-) TO ALL RESERVES	74634	35460	35461	35458	35460	35461	35460	35461	35460	35458
INTEREST IN DEFAULT	149	149	149	149	149	149	149	149	149	149
DEFERRED FEDERAL INCOME TAX	192444	223722	228866	228402	242562	238836	228547	216655	158092	150834
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	0	0
TOTAL FUNDS FROM OPERATIONS	1666177	1819245	1873539	1922104	2058375	2117238	2139502	2147698	1937914	1970807
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	0	0	0	0	0	0	0	59350	0
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	0	7054	7055	7054	7054	7056	7054	7054	7055	7054
DECREASE IN MISCELLANEOUS ASSETS	0	0	0	0	0	0	0	0	0	0
INCREASE IN FUNDED DEBT	0	0	0	0	0	0	0	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS	1011128	921293	212577	624687	1020436	839564	552330	358151	0	237248
INCREASE IN OTHER NON-CURRENT LIABILITIES**	42124	38044	38045	38044	38045	38044	38045	38044	38045	38044
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN OTHER LIABILITIES	0	0	0	0	0	0	0	0	0	0
SALE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF FUNDS	2719429	2785636	2131216	2591889	3123910	3001902	2736931	2550947	2042364	2253153

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

SCHEDULE 1-D(C)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

FUNDS FLOW ITEM				PROJECTED FUNDS FLOW						
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	472193	456315	463532	470750	477968	485187	492402	499618	506837	514054
INCREASE IN WORKING CAPITAL	171650	75673	24017	26480	67664	50371	34935	31228	0	31118
INCREASE IN INVESTMENT IN SECURITIES	71933	71933	71933	71933	71933	71933	71933	71933	71933	71933
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	3014122	2644043	1877591	2321836	3101650	2995844	2685549	2520927	1771007	2645804
INCREASE IN MISCELLANEOUS PROPERTY	29253	0	0	0	0	0	0	0	0	0
INCREASE IN MISCELLANEOUS ASSETS	4984	21077	21078	21078	21078	21077	21078	21077	21080	21077
DECREASE IN FUNDED DEBT	108949	103098	62939	149605	110419	74825	61787	56986	105950	0
DECREASE IN EQUIPMENT OBLIGATIONS	0	0	0	0	0	0	0	0	224067	0
DECREASE IN OTHER NON-CURRENT LIABILITIES**	0	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER LIABILITIES	192593	223871	229017	228551	242731	238985	228696	216804	158241	150983
REPURCHASE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF FUNDS	4065677	3596010	2750107	3290233	4093443	3938222	3596380	3418573	2859115	3434969
NET DIFFERENCE (SHORTFALL)	1346248	810374	618891	698344	969535	936320	859449	867626	816751	1181816

NOTE: SHORTFALLS ARE NOT CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN.,E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

SCHEDULE 1-E(C)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED FINANCIAL RATIOS
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(CONSTANT)

RATIO NO.	FINANCIAL RATIOS ITEM	1976	1977	1978	1979	PROJECTED FINANCIAL RATIOS 1980	1981	1982	1983	1984	1985	1976-85 AVERAGE
(1)	WORKING CAPITAL (MILLIONS OF DOLLARS)	950	1074	1124	1149	1196	1255	1298	1331	1317	1303	1227
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	32	34	35	35	35	36	36	36	37	35	35
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS) .	83.93%	82.91%	82.85%	82.88%	82.49%	82.58%	82.93%	83.39%	84.91%	85.23%	83.35%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS) .	78.86%	77.63%	77.40%	77.21%	76.48%	76.22%	76.20%	76.27%	77.56%	77.47%	76.94%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	2.21	2.23	2.21	2.13	2.07	1.95	1.86	1.78	1.57	1.53	1.93
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	0.48	0.52	0.51	0.50	0.50	0.49	0.49	0.48	0.45	0.45	0.49
(7)	CASH FLOW (MILLIONS OF DOLLARS)	1399	1560	1609	1658	1780	1843	1875	1895	1744	1784	1749
(8)	THROW-OFF TO DEBT RATIO	1.88	1.85	1.92	1.69	1.71	1.70	1.64	1.56	1.35	1.71	1.68
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	6.09%	6.58%	6.56%	6.38%	6.39%	6.03%	5.60%	5.16%	3.90%	3.62%	5.58%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.07	1.03	1.08	0.97	0.99	1.03	1.03	1.02	0.97	1.27	1.04
(11)	CAPITAL STRUCTURE RATIO	39.87%	40.23%	39.44%	39.27%	39.56%	39.62%	39.35%	38.83%	37.57%	36.95%	38.98%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	2.78	3.47	3.44	3.46	3.70	3.72	3.63	3.52	2.96	2.91	3.42
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	5.13%	5.46%	5.34%	5.30%	5.47%	5.40%	5.24%	5.06%	4.42%	4.37%	5.12%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	5.90%	4.18%	4.03%	3.82%	3.81%	3.52%	3.19%	2.88%	2.01%	1.85%	3.25%
(15)	DIVIDEND PAYOUT RATIO	77.%	64.%	66.%	65.%	63.%	65.%	69.%	74.%	104.%	110.%	75.%
(16)	OPERATING INCOME PROFIT MARGIN	5.81%	6.64%	6.75%	6.88%	7.35%	7.52%	7.48%	7.32%	6.53%	6.42%	6.99%

SCHEDULE 1-F(C)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL

% INCREASE IN REVENUE OR DECREASE IN EXPENSES
NEEDED TO ELIMINATE SHORTFALL OVER 9 YEARS

FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

	1977	1978	1979	1980	1981	1982	1983	1984	1985
PROJECTED DATA:									
TOTAL REVENUE	15486545	15867785	16258916	17204238	17897530	18433602	18937418	18156286	18673098
TOTAL EXPENSES	12021776	12281491	12553714	13157942	13640763	14046075	14443469	14082091	14466520
SHORTFALL	810374	618891	698344	969533	936320	859449	867626	816751	1181816
INCREASED REVENUE OPTION:									
INCREASE REQUIRED = 4.9%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	810374	618891	698344	969533	936320	859449	867626	816751	1181816
DECREASE IN SHORTFALL AFTER INCREASING REVENUE 4.9%	765773	784625	803965	850709	884991	911498	936411	897786	923341
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	44601	-165734	-105621	118824	51329	-52049	-68785	-81035	258475
DECREASED EXPENSE OPTION:									
DECREASE REQUIRED = 6.4%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	810374	618891	698344	969533	936320	859449	867626	816751	1181816
DECREASE IN SHORTFALL AFTER DECREASING EXPENSES 6.4%	772849	789546	807046	845891	876930	902987	928533	905302	930016
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	37525	-170655	-108702	123642	59390	-43538	-60907	-88551	251800

NOTE: THE ABOVE CALCULATIONS ARE BASED ON A REVENUE INCREASE OR EXPENSE DECREASE EFFECTIVE JANUARY 1,1977

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL — SCHEDULE 2-A(3)

PROJECTED BALANCE SHEET

FOR THE YEARS ENDING DECEMBER 31, 1976-1985

(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	BALANCE SHEET ITEM	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
					PROJECTED BALANCE SHEET						
1.	CURRENT ASSETS	1392708	1633096	1816364	2039997	2268386	2477072	2642791	2813755	2796574	2962309
2.	SPECIAL FUNDS	32365	32769	33176	33578	33983	34387	34792	35196	35601	36005
3.	INVESTMENTS	1003370	1031325	1059280	1087235	1115190	1143145	1171100	1199055	1227010	1254965
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	7085709	7421679	7646114	7978157	8507647	9018849	9452470	9832239	10052640	10478666
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-1958161	-1993064	-2034094	-2086324	-2155921	-2242184	-2341590	-2451656	-2565608	-2691901
6.	TOTAL TRANSPORTATION PROPERTY (NET)	5127548	5428615	5612020	5891833	6351726	6776665	7110880	7380583	7487032	7786765
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	65654	65667	65680	65693	65706	65719	65732	65745	65758	65771
8.	OTHER ASSETS & DEFERRED CHARGES	75286	78079	80872	83665	86458	89250	92043	94836	97629	100422
9.	TOTAL ASSETS	7696931	8269551	8667390	9202001	9921449	10586238	11117338	11589170	11709904	12206237
10.	CURRENT LIABILITIES	1009209	1183403	1316206	1478259	1643758	1794980	1915066	2038953	2026721	2146601
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	164795	205950	182135	225245	215065	239576	243136	253654	258470	224203
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	689096	643660	623996	571305	549757	517813	494256	475288	456320	456320
13.	EQUIPMENT OBLIGATIONS	992161	1132923	1182407	1298298	1537651	1746948	1884329	1963982	1917389	2035442
14.	OTHER NON-CURRENT LIABILITIES	631254	649526	668380	687234	706874	726514	746154	765794	785434	805226
15.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
16.	DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES	162872	173682	184492	195301	206111	216921	227731	238541	249351	260160
18.	OTHER LIABILITIES AND DEFERRED CREDITS	1015026	1015026	1015026	1015026	1015026	1015026	1015026	1015026	1015026	1015026
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	1034116	1034116	1034116	1034116	1034116	1034116	1034116	1034116	1034116	1034116
20.	CAPITAL SURPLUS	870856	870856	870856	870856	870856	870856	870856	870856	870856	870856
21.	RETAINED INCOME-BEGINNING YEAR	844860	1127526	1360409	1589776	1826361	2142235	2423488	2686668	2932960	3096221
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS	409538	146542	105812	180822	193216	188708	164613	134858	62512	20253
23.	MINUS CASH DIVIDENDS	126872	130949	134781	138614	142447	146279	150111	153943	157776	161608
24.	PLUS SHORTFALL***	312127	219290	258336	194377	265105	238824	248678	265377	258525	403421
25.	RETAINED INCOME-END OF YEAR	1127526	1360409	1589776	1826361	2142235	2423488	2686668	2932960	3096221	3358287
26.	TOTAL SHAREHOLDERS EQUITY	3032498	3265381	3494748	3731333	4047207	4328460	4591640	4837932	5001193	5263259
27.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	7696931	8269551	8667390	9202001	9921449	10586238	11117338	11589170	11709904	12206237

*** SHORTFALLS ARE ADDED TO RETAINED INCOME SO THAT THEY WILL NOT BE CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN.,E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

CLASS I [illegible] RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL SCHEDULE 2-B(1)
PROJECTED INCOME STATEMENT
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	INCOME STATEMENT ITEM				PROJECTED INCOME STATEMENT						
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	RAILWAY OPERATING REVENUES	3359164	3869345	4283148	4771874	5282451	5748120	6119980	6497740	6442727	6807016
2.	OPERATING EXPENSES	2697260	3039011	3439712	3691691	4064818	4431603	4766796	5123921	5205767	5572797
3.	NET REVENUE FROM RAILWAY OPERATIONS	661904	830334	843436	1080183	1217633	1316517	1353184	1373819	1236960	1234219
4.	TOTAL TAX ACCRUALS	313304	382569	399716	485931	534142	568444	583903	599800	551981	556982
5.	PROVISIONS FOR DEFERRED TAXES ...	42482	43036	46145	78858	84264	82298	71789	58813	27261	8832
6.	RAILWAY OPERATING INCOME	306118	404729	397577	515394	599227	665775	697492	715206	657718	668405
7.	NET RENTS	-171405	-206027	-233494	-267023	-314182	-361416	-401879	-441364	-460823	-504825
8.	NET RAILWAY OPERATING INCOME	134713	198702	164083	248371	285045	304359	295613	273842	196895	163580
9.	OTHER INCOME	123733	126306	128879	131453	134026	136599	139172	141745	144318	146891
10.	TOTAL INCOME	258446	325008	292962	379824	419071	440958	434785	415587	341213	310471
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	8552	8776	9000	9224	9448	9672	9896	10120	10344	10568
12.	INCOME AVAILABLE FOR FIXED CHARGES	249894	316232	283962	370600	409623	431286	424889	405467	330869	299903
13.	RENT FOR LEASED ROADS & EQUIPMENT	10959	10959	10959	10959	10959	10959	10959	10959	10959	10959
14.	INTEREST ON FUNDED DEBT	137551	156758	163218	174846	201475	227646	245344	255677	253425	264718
15.	INTEREST ON UNFUNDED DEBT	3973	3973	3973	3973	3973	3973	3973	3973	3973	3973
16.	TOTAL FIXED CHARGES**	152483	171690	178150	189778	216407	242578	260276	270609	268357	279650
17.	ORDINARY INCOME	97411	144542	105812	180822	193216	188708	164613	134858	62512	20253
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	0	0	0	0	0	0	0	0	0
19.	NET INCOME	97411	144542	105812	180822	193216	188708	164613	134858	62512	20253

** INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL SCHEDULE 2-C(I)
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

FUNDS FLOW ITEM	PROJECTED FUNDS FLOW 1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	97411	144542	105812	180822	193216	188708	164613	134856	62512	20253
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY AND EQUIPMENT DEPRECIATION	185501	197605	204848	216416	235976	254574	269796	282591	288577	302873
ROAD PROPERTY AND EQUIPMENT RETIREMENTS	432	432	432	432	432	432	432	432	432	432
TOTAL DEPRECIATION AND RETIREMENTS	185933	198037	205280	216848	236408	255006	270228	283023	289009	303305
INCREASES/DECREASES (-) TO ALL RESERVES	-13733	10810	10810	10809	10810	10810	10810	10810	10810	10809
INTEREST IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DEFERRED FEDERAL INCOME TAX	42482	63036	46145	78858	84264	82298	71789	58813	27261	8832
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	0	0
TOTAL FUNDS FROM OPERATIONS	312093	416425	368047	487337	524698	536822	517440	487504	389592	343199
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	0	0	0	0	0	0	0	4649	0
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	159	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS ASSETS	20160	0	0	0	0	0	0	0	0	0
INCREASE IN FUNDED DEBT	0	0	0	0	0	0	0	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS	156936	181897	25669	159001	229173	233808	140941	90171	0	83786
INCREASE IN OTHER NON-CURRENT LIABILITIES**	593	19792	19792	19792	19792	19792	19792	19792	19792	19792
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN OTHER LIABILITIES	0	0	0	0	0	0	0	0	0	0
SALE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF FUNDS	489741	618114	413508	666130	773663	790422	678173	597467	414033	446777

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL SCHEDULE 2-B(1)
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

FUNDS FLOW ITEM				PROJECTED FUNDS FLOW						
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	126872	130949	134761	138614	142447	146279	150111	153943	157776	161608
INCREASE IN WORKING CAPITAL	101405	66194	50465	61580	62890	57464	45633	47077	0	45555
INCREASE IN INVESTMENT IN SECURITIES	27955	27955	27955	27955	27955	27955	27955	27955	27955	27955
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	458594	499104	388685	496661	696301	679945	604443	552726	395458	603038
INCREASE IN MISCELLANEOUS PROPERTY	0	13	13	13	13	13	13	13	13	13
INCREASE IN MISCELLANEOUS ASSETS ..	0	3197	3198	3197	3198	3196	3198	3197	3198	3197
DECREASE IN FUNDED DEBT	44560	46956	20602	53629	21700	32096	23709	19120	19120	0
DECREASE IN EQUIPMENT OBLIGATIONS .	0	0	0	0	0	0	0	0	41777	0
DECREASE IN OTHER NON-CURRENT LIABILITIES**	0	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER LIABILITIES	42482	63036	66145	78858	86264	82298	71789	58813	27261	8832
REPURCHASE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF FUNDS	801868	837404	671844	860507	1038768	1029246	926851	862844	672558	850198
NET DIFFERENCE (SHORTFALL)	312127	219290	258336	194377	265105	238824	248678	265377	258525	403421

NOTE: SHORTFALLS ARE NOT CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME
TYPE OF CORRECTIVE ACTION WILL BE TAKEN, E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL
EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS
AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL SCHEDULE 2-E(I)
PROJECTED FINANCIAL RATIOS
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(INFLATED)

RATIO NO.	FINANCIAL RATIOS ITEM	1976	1977	1978	1979	PROJECTED FINANCIAL RATIOS 1980	1981	1982	1983	1984	1985	1976-85 AVERAGE
(1)	WORKING CAPITAL (MILLIONS OF DOLLARS)	333	417	475	531	593	653	705	751	772	793	632
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	47	52	52	55	55	56	56	55	56	54	54
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS)	85.40%	83.43%	85.76%	82.96%	82.90%	83.38%	84.46%	85.65%	87.95%	89.28%	85.09%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS)	80.30%	78.14%	80.31%	77.36%	76.95%	77.10%	77.89%	78.86%	80.80%	81.87%	78.81%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	2.09	2.43	2.01	2.62	2.52	2.33	2.08	1.85	1.40	1.12	2.04
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	0.49	0.57	0.60	0.64	0.66	0.68	0.68	0.69	0.67	0.69	0.65
(7)	CASH FLOW (MILLIONS OF DOLLARS)	283	343	311	398	430	444	435	418	352	324	383
(8)	THROW-OFF TO DEBT RATIO	1.72	1.66	1.71	1.77	2.00	1.85	1.79	1.65	1.36	1.44	1.69
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	4.94%	6.33%	4.21%	6.46%	6.23%	5.59%	4.58%	3.54%	1.65%	0.51%	4.34%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.13	0.96	1.12	0.96	1.10	1.06	1.11	1.11	1.12	1.35	1.10
(11)	CAPITAL STRUCTURE RATIO	44.96%	44.63%	43.19%	42.71%	42.65%	42.74%	42.31%	41.69%	40.59%	40.08%	42.29%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	1.98	2.93	2.30	3.32	3.58	3.57	3.29	2.92	2.05	1.66	2.85
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	4.50%	5.35%	4.53%	5.68%	5.88%	5.75%	5.33%	4.85%	3.83%	3.36%	4.95%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	3.37%	4.59%	3.13%	5.00%	4.97%	4.51%	3.69%	2.86%	1.27%	0.39%	3.38%
(15)	DIVIDEND PAYOUT RATIO	129.%	90.%	127.%	76.%	73.%	77.%	91.%	114.%	251.%	794.%	188.%
(16)	OPERATING INCOME PROFIT MARGIN	4.01%	5.11%	3.83%	5.20%	5.40%	5.29%	4.83%	4.21%	3.06%	2.40%	4.37%

SCHEDULE 2-F(1)

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL

% INCREASE IN REVENUE OR DECREASE IN EXPENSES
NEEDED TO ELIMINATE SHORTFALL OVER 9 YEARS

FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

	1977	1978	1979	1980	1981	1982	1983	1984	1985
PROJECTED DATA:									
TOTAL REVENUE	3889345	4283148	4771874	5282451	5748120	6119980	6497740	6442727	6807016
TOTAL EXPENSES	3139011	3439712	3691691	4064818	4431603	4766796	5123921	5205767	5572797
SHORTFALL	219290	258336	194377	265105	238824	248678	265377	258525	403421
INCREASED REVENUE OPTION:									
INCREASE REQUIRED = 4.7% ****									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	219290	258336	194377	265105	238824	248678	265377	258525	403421
DECREASE IN SHORTFALL AFTER INCREASING REVENUE 4.7%	183528	202110	225172	249265	271238	288785	306611	304015	321205
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	35762	56226	-30795	15840	-32414	-40107	-41234	-45490	82216
DECREASED EXPENSE OPTION:									
DECREASE REQUIRED = 6.0% ****									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	219290	258336	194377	265105	238824	248678	265377	258525	403421
DECREASE IN SHORTFALL AFTER DECREASING EXPENSES 6.0%	181704	205662	220728	243038	264968	285009	306362	311256	333201
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	37586	52674	-26351	22067	-26144	-36331	-40985	-52731	70220

NOTE: THE ABOVE CALCULATIONS ARE BASED ON A REVENUE INCREASE OR EXPENSE DECREASE EFFECTIVE JANUARY 1,1977

SCHEDULE 3-A(1)

CLASS 1 LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	BALANCE SHEET ITEM	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
						PROJECTED BALANCE SHEET					
1.	CURRENT ASSETS	1063028	1234312	1369639	1515810	1676906	1832234	1977979	2127814	2161602	2341526
2.	SPECIAL FUNDS	36857	37089	37321	37553	37785	38018	38250	38482	38714	38946
3.	INVESTMENTS	1170515	1204965	1239415	1273865	1308315	1342765	1377215	1411665	1446115	1480565
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	7585655	8293098	8815172	9561800	10669484	11787682	12831752	13829542	14533169	15779305
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-1586758	-1687273	-1801142	-1935921	-2105173	-2308691	-2563082	-2806078	-3085762	-3403373
6.	TOTAL TRANSPORTATION PROPERTY (NET)	5998897	6605825	7014030	7625879	8564311	9478991	10268670	11023464	11447407	12375932
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	81065	81583	82100	82618	83135	83652	84169	84687	85204	85721
8.	OTHER ASSETS & DEFERRED CHARGES .	109834	117124	124416	131704	138994	146283	153573	160863	168153	175443
9.	TOTAL ASSETS	8460196	9280898	9866919	10667429	11809446	12921943	13919856	14846975	15347195	16498133
10.	CURRENT LIABILITIES	817714	949471	1053569	1166008	1289928	1409411	1521523	1636780	1662771	1801174
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	212805	230971	243156	292417	309791	350192	395398	433630	507944	432041
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	746652	730956	718563	680913	669378	657843	642331	630981	569846	569846
13.	EQUIPMENT OBLIGATIONS	1501780	1778340	1693547	2146121	2620227	3057115	3392566	3645338	3648388	4063005
14.	OTHER NON-CURRENT LIABILITIES	73035	75589	78617	82044	85272	88495	91743	94990	98238	101490
15.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
16.	DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES ..	78666	82524	86383	90241	94099	97958	101816	105675	109533	113391
18.	OTHER LIABILITIES AND DEFERRED CREDITS	688065	688065	688065	688065	688065	688065	688065	688065	688065	688065
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	627529	627529	627529	627529	627529	627529	627529	627529	627529	627529
20.	CAPITAL SURPLUS	687020	687020	687020	687020	687020	687020	687020	687020	687020	687020
21.	RETAINED INCOME-BEGINNING YEAR .	2365853	3026930	3430433	3790273	4207071	4738137	5258315	5771865	6296967	6747861
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS....	743564	172821	126727	209860	223027	216371	196539	171861	62136	34656
23.	MINUS CASH DIVIDENDS.............	82487	86825	88656	90487	92318	94151	95980	97810	99642	101473
24.	PLUS SHORTFALL***	634202	317507	321769	297425	400357	397958	412991	451051	488400	733528
25.	RETAINED INCOME-END OF YEAR......	3026930	3430433	3790273	4207071	4738137	5258315	5771865	6296967	6747861	7414572
26.	TOTAL SHAREHOLDERS EQUITY.........	4341479	4744982	5104822	5521620	6052686	6572864	7086414	7611516	8062410	8729121
27.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY......	8460196	9280898	9866919	10667429	11809446	12921943	13919856	14846975	15347195	16498133

*** SHORTFALLS ARE ADDED TO RETAINED INCOME SO THAT THEY WILL NOT BE CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN.,E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

SCHEDULE 3-B(1)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED INCOME STATEMENT
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	INCOME STATEMENT ITEM					PROJECTED INCOME STATEMENT					
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	RAILWAY OPERATING REVENUES	3244046	3759207	4104120	4559760	5021112	5453752	5858982	6271846	6300078	6800470
2.	OPERATING EXPENSES	2563327	2870580	3217138	3446335	3759011	4075839	4402792	4747399	4930109	5342302
3.	NET REVENUE FROM RAILWAY OPERATIONS	680719	888627	886982	1113425	1262101	1377913	1456190	1524447	1369969	1458168
4.	TOTAL TAX ACCRUALS	260785	315608	330714	392368	424504	447256	464437	483561	446638	467825
5.	PROVISIONS FOR DEFERRED TAXES ...	28763	45453	33330	55194	58658	56907	51691	45200	16342	9114
6.	RAILWAY OPERATING INCOME	391171	527566	522938	665863	778939	873750	940062	995686	906989	981229
7.	NET RENTS	-288292	-250145	-279177	-313847	-364044	-414969	-460805	-510230	-527277	-591853
8.	NET RAILWAY OPERATING INCOME	102879	277421	243761	352016	414895	458781	479257	485456	379712	389376
9.	OTHER INCOME	151294	154651	158008	161365	164722	168079	171436	174793	178150	181507
10.	TOTAL INCOME	334173	432072	401769	513381	579617	626860	650693	660249	557862	570883
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	20025	20585	21144	21704	22263	22823	23382	23942	24501	25061
12.	INCOME AVAILABLE FOR FIXED CHARGES	314148	411487	380625	491677	557354	604037	627311	636307	533361	545822
13.	RENT FOR LEASED ROADS & EQUIPMENT	13130	13130	13130	13130	13130	13130	13130	13130	13130	13130
14.	INTEREST ON FUNDED DEBT	190627	224507	239739	267658	320168	373507	416613	450287	457066	497007
15.	INTEREST ON UNFUNDED DEBT	1029	1029	1029	1029	1029	1029	1029	1029	1029	1029
16.	TOTAL FIXED CHARGES**	204786	238666	253896	281817	334327	387666	430772	464446	471225	511166
17.	ORDINARY INCOME	109362	172821	126727	209860	223027	216371	196539	171861	62136	34656
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	0	0	0	0	0	0	0	0	0
19.	NET INCOME	109362	172821	126727	209860	223027	216371	196539	171861	62136	34656

** INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

SCHEDULE 3-C(1)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

FUNDS FLOW ITEM					PROJECTED FUNDS FLOW					
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	109362	172821	126727	209860	223027	216371	196539	171861	62136	34656
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY AND EQUIPMENT DEPRECIATION	195077	219653	236558	262119	301673	341311	377730	411984	434289	477670
ROAD PROPERTY AND EQUIPMENT RETIREMENTS	1555	1555	1555	1555	1555	1555	1555	1555	1555	1555
TOTAL DEPRECIATION AND RETIREMENTS	196632	221208	238113	263674	303228	342866	379285	413539	435844	479225
INCREASES/DECREASES (-) TO ALL RESERVES	24550	3858	3859	3858	3858	3859	3858	3859	3858	3858
INTEREST IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DEFERRED FEDERAL INCOME TAX	29763	45453	33333	55194	58658	56907	51691	45200	16342	9114
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	0	0
TOTAL FUNDS FROM OPERATIONS	359307	443340	402029	532586	588771	620003	631373	634459	518180	526853
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	0	0	0	0	0	0	0	0	0
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	223	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS ASSETS	0	0	0	0	0	0	0	0	0	0
INCREASE IN FUNDED DEBT	0	0	0	0	0	0	0	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS	341962	294726	127392	301835	491480	477289	380657	291004	77364	338714
INCREASE IN OTHER NON-CURRENT LIABILITIES**	0	3252	3253	3252	3253	3252	3253	3252	3253	3252
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN OTHER LIABILITIES	0	0	0	0	0	0	0	0	0	0
SALE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF FUNDS	701492	741318	532674	837673	1083504	1100544	1015283	928715	598797	868819

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

SCHEDULE 3-D(I)

FUNDS FLOW ITEM	1976	1977	1978	PROJECTED FUNDS FLOW 1979	1980	1981	1982	1983	1984	1985
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	82487	86825	88656	90487	92318	94151	95980	97810	99642	101473
INCREASE IN WORKING CAPITAL	61209	39527	31229	33732	37176	35845	33633	34578	7797	41521
INCREASE IN INVESTMENT IN SECURITIES	34450	34450	34450	34450	34450	34450	34450	34450	34450	34450
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	1080618	828136	646318	875523	1241660	1257546	1188964	1148333	859787	1407750
INCREASE IN MISCELLANEOUS PROPERTY	0	518	517	518	517	517	517	518	517	517
INCREASE IN MISCELLANEOUS ASSETS	9067	7522	7522	7522	7522	7522	7522	7522	7522	7522
DECREASE IN FUNDED DEBT	36621	16394	12421	37672	11560	11564	15517	11355	61140	0
DECREASE IN EQUIPMENT OBLIGATIONS	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER NON-CURRENT LIABILITIES**	2479	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER LIABILITIES	28763	45453	33333	55194	58658	56907	51691	45200	16342	9114
REPURCHASE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF FUNDS	1335694	1058825	854443	1135098	1483861	1498502	1428274	1379766	1087197	1602347
NET DIFFERENCE (SHORTFALL)	634202	317507	321769	297425	400357	397958	412991	451051	488400	733528

NOTE: SHORTFALLS ARE NOT CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN.,E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

SCHEDULE 3-E(1)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED FINANCIAL RATIOS
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(INFLATED)

RATIO NO.	FINANCIAL RATIOS ITEM					PROJECTED FINANCIAL RATIOS						1976-85
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	AVERAGE
(1)	WORKING CAPITAL (MILLIONS OF DOLLARS)	215	265	300	333	368	405	440	474	495	520	400
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	32	36	36	37	38	39	39	39	39	38	37
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS)	85.44%	83.02%	85.19%	82.46%	82.11%	82.34%	83.01%	83.83%	86.62%	87.26%	83.98%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS)	79.02%	76.36%	78.39%	75.58%	74.86%	74.73%	75.15%	75.69%	78.25%	78.56%	76.40%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	1.75	2.02	1.70	2.05	1.94	1.79	1.64	1.52	1.19	1.10	1.66
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	0.47	0.56	0.55	0.57	0.57	0.55	0.55	0.54	0.52	0.53	0.55
(7)	CASH FLOW (MILLIONS OF DOLLARS)	306	394	365	474	526	559	576	585	498	516	499
(8)	THROW-OFF TO DEBT RATIO	1.44	1.71	1.50	1.62	1.70	1.60	1.48	1.35	0.98	1.19	1.46
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	4.74%	6.47%	4.34%	6.47%	6.25%	5.58%	4.72%	3.85%	1.39%	0.72%	4.42%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	0.92	0.95	0.97	0.90	0.97	0.97	0.96	0.95	0.85	1.11	0.96
(11)	CAPITAL STRUCTURE RATIO	36.86%	37.24%	36.50%	36.70%	37.84%	38.72%	38.95%	38.70%	37.44%	37.18%	37.70%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	2.66	3.98	3.24	4.37	4.68	4.67	4.47	4.21	3.13	3.03	3.97
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	4.71%	5.52%	4.71%	5.71%	5.90%	5.78%	5.50%	5.19%	4.11%	3.98%	5.15%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	2.73%	3.80%	2.57%	3.95%	3.85%	3.43%	2.88%	2.34%	0.79%	0.41%	2.67%
(15)	DIVIDEND PAYOUT RATIO	72.%	68.%	67.%	41.%	39.%	42.%	47.%	54.%	154.%	281.%	86.%
(16)	OPERATING INCOME PROFIT MARGIN	5.64%	7.38%	5.94%	7.72%	8.26%	8.41%	8.18%	7.74%	6.03%	5.73%	7.27%

SCHEDULE 3-F(1)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT

% INCREASE IN REVENUE OR DECREASE IN EXPENSES
NEEDED TO ELIMINATE SHORTFALL OVER 9 YEARS

FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

	1977	1978	1979	1980	1981	1982	1983	1984	1985
PROJECTED DATA:									
TOTAL REVENUE	3759207	4104120	4559760	5021112	5453752	5858982	6271846	6300078	6800470
TOTAL EXPENSES	2970580	3217138	3446335	3759011	4075839	4402792	4747399	4930109	5342302
SHORTFALL	317507	321769	297425	400357	397958	412991	451051	488400	733528
INCREASED REVENUE OPTION:									
INCREASE REQUIRED = 7.9%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	317507	321769	297425	400357	397958	412991	451051	488400	733528
DECREASE IN SHORTFALL AFTER INCREASING REVENUE 7.9%	298443	325825	361999	398625	432973	465144	497921	500163	539889
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	19064	-4056	-64574	1732	-35015	-52153	-46870	-11763	193639
DECREASED EXPENSE OPTION:									
DECREASE REQUIRED =10.4%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	317507	321769	297425	400357	397958	412991	451051	488400	733528
DECREASE IN SHORTFALL AFTER DECREASING EXPENSES10.4%	298124	334116	357919	390392	423296	457252	493041	512017	554825
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	19383	-12347	-60494	9965	-25338	-44261	-41990	-23617	178703

NOTE: THE ABOVE CALCULATIONS ARE BASED ON A REVENUE INCREASE OR EXPENSE DECREASE EFFECTIVE JANUARY 1,1977

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-A(3)
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	BALANCE SHEET ITEM	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
					PROJECTED BALANCE SHEET						
1.	CURRENT ASSETS	2670431	3124586	3488819	3888787	4325860	4734771	5152612	5621143	5724219	6231055
2.	SPECIAL FUNDS	142022	143571	145120	146670	148219	149769	151318	152867	154417	155966
3.	INVESTMENTS	1396944	1406472	1416000	1425528	1435056	1444584	1454112	1463640	1473168	1482696
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	18687868	20081272	20995169	22261239	24174410	26147697	28038041	29965036	31267635	33591949
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-4645415	-4745540	-4877190	-5049356	-5283547	-5580309	-5935454	-6348635	-6795869	-7312248
6.	TOTAL TRANSPORTATION PROPERTY (NET)	14042453	15335732	16117979	17211883	18890863	20567388	22102587	23616401	24471766	26279701
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	265432	257847	250262	242677	235093	227507	219923	212338	204753	197169
8.	OTHER ASSETS & DEFERRED CHARGES	197262	206071	214880	223689	232498	241307	250116	258925	267735	276544
9.	TOTAL ASSETS	18714544	20474279	21633060	23139234	25267589	27365326	29330668	31325314	32296058	34623131
10.	CURRENT LIABILITIES	2153574	2519828	2813564	3136119	3488597	3818364	4155333	4533180	4616306	5025045
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	378309	436849	461581	541354	646602	677642	747521	833256	880239	830402
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	2048747	2022275	1998828	1946267	1874359	1847784	1826969	1802103	1777994	1777996
13.	EQUIPMENT OBLIGATIONS	2866313	3543279	3788705	4230058	5053160	5826272	6439331	6974219	6979262	7751015
14.	OTHER NON-CURRENT LIABILITIES	306020	307744	316275	325532	335281	345691	358945	372300	385719	400719
15.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
16.	DEBT IN DEFAULT	2340	2340	2340	2340	2340	2340	2340	2340	2340	2340
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES	297405	318197	338989	359780	380572	401364	422156	442948	463740	484531
18.	OTHER LIABILITIES AND DEFERRED CREDITS	2016623	2016623	2016623	2016623	2016623	2016623	2016623	2016623	2016623	2016623
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	2390736	2390736	2390736	2390736	2390736	2390736	2390736	2390736	2390736	2390736
20.	CAPITAL SURPLUS	468957	468957	468957	468957	468957	468957	468957	468957	468957	468957
21.	RETAINED INCOME-BEGINNING YEAR	5052628	5765520	6447451	7036462	7721468	8610362	9569553	10501757	11488652	12314142
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS	975726	584272	503686	766128	795135	783758	750606	704979	633647	552959
23.	MINUS CASH DIVIDENDS	262834	238541	240095	241649	243203	244757	246311	247865	249419	250973
24.	PLUS SHORTFALL***	512816	336200	325420	160527	336962	420190	427909	529781	441262	858641
25.	RETAINED INCOME-END OF YEAR	5765520	6447451	7036462	7721468	8610362	9569553	10501757	11488652	12314142	13474769
26.	TOTAL SHAREHOLDERS EQUITY	8625213	9307144	9896155	10581161	11470055	12429246	13361450	14348345	15173835	16334462
27.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	18714544	20474279	21633060	23139234	25267589	27365326	29330668	31325314	32296058	34623131

*** SHORTFALLS ARE ADDED TO RETAINED INCOME SO THAT THEY WILL NOT BE CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN.,E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-B(1)
PROJECTED INCOME STATEMENT
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	INCOME STATEMENT ITEM				PROJECTED INCOME STATEMENT						
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	RAILWAY OPERATING REVENUES	9167586	10726024	11918839	13329949	14788801	16136841	17540515	19113060	19424502	21115952
2.	OPERATING EXPENSES	7133580	8185658	9290440	9984800	11045716	12070616	13186060	14439813	14794232	16171789
3.	NET REVENUE FROM RAILWAY OPERATIONS	2034006	2540366	2628399	3345149	3743085	4066225	4354455	4673247	4630270	4944163
4.	TOTAL TAX ACCRUALS	861833	1017461	1087649	1305179	1413808	1494301	1568081	1653287	1638432	1705581
5.	PROVISIONS FOR DEFERRED TAXES ...	147073	165632	160028	243610	252626	249012	238479	223982	201319	175683
6.	RAILWAY OPERATING INCOME	1025104	1337273	1380722	1796360	2076651	2322912	2547895	2795978	2790519	3062899
7.	NET RENTS	-411061	-524747	-616038	-719210	-877408	-1043606	-1224710	-1446023	-1498761	-1769856
8.	NET RAILWAY OPERATING INCOME	614043	812526	764684	1077150	1199243	1279306	1323185	1349955	1291758	1293043
9.	OTHER INCOME	277289	277604	277919	278234	278549	278864	279179	279494	279809	280124
10.	TOTAL INCOME	891332	1090130	1042603	1355384	1477792	1558170	1602364	1629449	1571567	1573167
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	46547	46601	46655	46709	46763	46817	46871	46925	46979	47033
12.	INCOME AVAILABLE FOR FIXED CHARGES	844785	1043529	995948	1308675	1431029	1511353	1555493	1582524	1524588	1526134
13.	RENT FOR LEASED ROADS & EQUIPMENT	1681	1681	1681	1681	1681	1681	1681	1681	1681	1681
14.	INTEREST ON FUNDED DEBT	374056	451436	484441	534726	628073	719774	797066	869724	883120	965354
15.	INTEREST ON UNFUNDED DEBT	6140	6140	6140	6140	6140	6140	6140	6140	6140	6140
16.	TOTAL FIXED CHARGES**	381877	459257	492262	542547	635894	727595	804887	877545	890941	973175
17.	ORDINARY INCOME	462908	584272	503686	766128	795135	783758	750606	704979	633647	552959
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	0	0	0	0	0	0	0	0	0
19.	NET INCOME	462908	584272	503686	766128	795135	783758	750606	704979	633647	552959

** INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-C(3)
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

FUNDS FLOW ITEM	1976	1977	1978	1979	PROJECTED FUNDS FLOW 1980	1981	1982	1983	1984	1985
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	662903	596272	503686	766128	795135	783758	750606	704979	633647	552959
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY AND EQUIPMENT DEPRECIATION	628665	473307	499713	538552	600178	662974	722223	781846	818408	891180
ROAD PROPERTY AND EQUIPMENT RETIREMENTS	9572	9572	9572	9572	9572	9572	9572	9572	9572	9572
TOTAL DEPRECIATION AND RETIREMENTS	638237	482879	509285	548124	609750	672546	731795	791418	827980	900752
INCREASES/DECREASES (-) TO ALL RESERVES	55617	20792	20792	20791	20792	20792	20792	20792	20792	20791
INTEREST IN DEFAULT	149	149	149	149	149	149	149	149	149	149
DEFERRED FEDERAL INCOME TAX	167075	165632	180026	243610	252626	249012	238479	223982	201319	175683
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	0	0
TOTAL FUNDS FROM OPERATIONS	1111904	1273724	1193965	1578802	1678452	1726257	1741821	1741320	1683887	1650334
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	0	0	0	0	0	0	0	0	0
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	0	7585	7585	7585	7584	7586	7584	7585	7585	7584
DECREASE IN MISCELLANEOUS ASSETS	0	0	0	0	0	0	0	0	0	0
INCREASE IN FUNDED DEBT	0	0	0	0	0	0	0	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS	667431	715506	270158	521126	928350	804152	682938	620623	52026	721916
INCREASE IN OTHER NON-CURRENT LIABILITIES**	44270	15000	15000	15000	15000	15000	15000	15000	15000	15000
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN OTHER LIABILITIES	0	0	0	0	0	0	0	0	0	0
SALE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF FUNDS	1823605	2011815	1486683	2122513	2629386	2552995	2447343	2384528	1758498	2394834

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE A-8(I)
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

FUNDS FLOW ITEM	PROJECTED FUNDS FLOW 1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	262834	238541	240095	241649	243203	244757	246311	247865	249419	250973
INCREASE IN WORKING CAPITAL	119673	87901	70497	77613	84595	79166	80872	90684	19950	98097
INCREASE IN INVESTMENT IN SECURITIES	9528	9528	9528	9528	9528	9528	9528	9528	9528	9528
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	1724686	1776158	1291532	1642028	2288750	2349071	2266994	2305232	1683345	2708687
INCREASE IN MISCELLANEOUS PROPERTY	29635	0	0	0	0	0	0	0	0	0
INCREASE IN MISCELLANEOUS ASSETS ..	16077	10358	10358	10359	10358	10359	10358	10358	10360	10358
DECREASE IN FUNDED DEBT	27762	39748	29916	58304	77159	31165	22561	26511	25690	0
DECREASE IN EQUIPMENT OBLIGATIONS .	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER NON-CURRENT LIABILITIES**	0	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER LIABILITIES	147222	185701	160177	243559	252775	249161	238628	224131	201468	175832
REPURCHASE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF FUNDS	2336623	2348015	1812103	2282860	2966348	2973185	2875252	2914309	2199780	3253475
NET DIFFERENCE (SHORTFALL)	512818	336200	325620	160527	336962	420190	427909	529781	441262	858641

NOTE: SHORTFALLS ARE NOT CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN, E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-E(I)
PROJECTED FINANCIAL RATIOS
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(INFLATED)

RATIO NO.	FINANCIAL RATIOS ITEM	1976	1977	1978	1979	PROJECTED FINANCIAL RATIOS 1980	1981	1982	1983	1984	1985	1976-85 AVERAGE
(1)	WORKING CAPITAL (MILLIONS OF DOLLARS)	458	561	640	716	795	877	957	1043	1098	1157	871
(2)	AVERAGE DAILY WORKING CAPITAL COVERAGE	24	26	26	27	27	27	27	27	28	27	26
(3)	OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS)	82.50%	81.21%	83.12%	80.30%	80.62%	81.27%	82.16%	83.12%	83.88%	84.97%	82.29%
(4)	OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS)	77.81%	76.32%	77.95%	74.91%	74.69%	74.80%	75.17%	75.55%	76.16%	76.59%	75.79%
(5)	FIXED AND CONTINGENT CHARGE COVERAGE	2.77	2.86	2.50	3.07	2.83	2.58	2.37	2.18	2.04	1.83	2.47
(6)	TURNOVER OF TRANSPORTATION INVESTMENT	0.55	0.64	0.67	0.70	0.72	0.72	0.72	0.73	0.71	0.73	0.70
(7)	CASH FLOW (MILLIONS OF DOLLARS)	901	1067	1013	1314	1405	1456	1482	1496	1462	1454	1349
(8)	THROW-OFF TO DEBT RATIO	2.38	2.44	2.19	2.43	2.17	2.15	1.98	1.80	1.66	1.75	2.06
(9)	RATIO OF ORDINARY INCOME TO OPERATING REVENUES	7.39%	7.98%	6.19%	8.41%	7.87%	7.11%	6.27%	5.40%	4.78%	3.83%	6.43%
(10)	RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.13	1.08	1.08	0.99	0.93	0.98	0.97	0.94	0.93	1.07	1.00
(11)	CAPITAL STRUCTURE RATIO	39.46%	40.41%	39.69%	39.97%	40.82%	41.17%	41.23%	41.03%	39.78%	39.72%	40.45%
(12)	RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	5.71	4.88	4.27	5.66	5.82	5.69	5.44	5.18	4.72	4.48	5.13
(13)	RATE OF RETURN ON TOTAL CAPITALIZATION	6.22%	6.98%	6.20%	7.67%	7.72%	7.45%	7.08%	6.72%	6.15%	5.83%	6.87%
(14)	RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	5.60%	6.52%	5.25%	7.48%	7.21%	6.56%	5.82%	5.09%	4.29%	3.51%	5.75%
(15)	DIVIDEND PAYOUT RATIO	54.%	39.%	45.%	30.%	29.%	30.%	31.%	33.%	37.%	43.%	35.%
(16)	OPERATING INCOME PROFIT MARGIN	6.70%	7.58%	6.42%	8.08%	8.11%	7.93%	7.54%	7.06%	6.65%	6.12%	7.28%

SCHEDULE 1-A(I)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	BALANCE SHEET ITEM	PROJECTED BALANCE SHEET 1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	CURRENT LIABILITIES	3980497	4652702	5183339	5780386	6422283	7022755	7591922	8208913	8305798	8972820
	TIMES FACTOR(BY REGION)	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
	EQUALS MINIMUM CURRENT ASSETS	4935816	5769350	6427340	7167678	7963630	8708216	9413983	10179052	10299189	11126296
	PRESENT CURRENT ASSETS	3667020	3659850	3437153	3554596	3378730	3094683	2734410	2277531	1209327	65932
	PLUS PREVIOUS NET SHORTFALLS	0	1268796	2109500	2990187	3613082	4584900	5613533	6679573	7901521	9089862
	EQUALS ADJUSTED CURRENT ASSETS	3667020	4928646	5546653	6544783	6991812	7679583	8347943	8957104	9110848	9155794
	SHORTFALL (TO BE ADDED TO CASH) ("-" INDICATES NO SHORTFALL)	1268796	840704	880687	622895	971818	1028633	1066040	1221948	1188341	1970502
	PRESENT CASH	219078	-416597	-1086175	-1695438	-2254057	-3088076	-3984799	-5009989	-6187626	-7972358
	PLUS PREVIOUS NET SHORTFALLS (WHICH WILL INCREASE CASH)	0	1268796	2109500	2990187	3613082	4584900	5613533	6679573	7901521	9089862
	EQUALS ADJUSTED CASH	219078	852199	1023326	1294749	1359025	1496824	1628734	1669584	1713895	1117504
	EQUALS MINIMUM NEW CASH FIGURE	1627874	1696963	1904011	2117644	2330843	2525457	2694774	2891532	2902236	3088006

SCHEDULE 1-B(1)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED INCOME STATEMENT
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	INCOME STATEMENT ITEM	PROJECTED INCOME STATEMENT									
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	RAILWAY OPERATING REVENUES	15770798	18374576	20306107	22661583	25092364	27338713	29519477	31882646	32167307	34723438
2.	OPERATING EXPENSES	12394167	14095249	15947290	17122826	18869545	20578058	22355648	24311133	24930108	27086888
3.	NET REVENUE FROM RAILWAY OPERATIONS	3376631	4279327	4358817	5538757	6222819	6760655	7163829	7571513	7237199	7636550
4.	TOTAL TAX ACCRUALS	1435920	1715638	1818077	2183678	2372454	2510001	2616421	2736648	2637051	2730388
5.	PROVISIONS FOR DEFERRED TAXES ...	218318	294121	239503	377462	395548	388217	361959	327995	244922	193629
6.	RAILWAY OPERATING INCOME	1722393	2269568	2301237	2977617	3454817	3862437	4185449	4506870	4355226	4712533
7.	NET RENTS	-790758	-980919	-1128709	-1300080	-1555634	-1819991	-2087394	-2397617	-2486861	-2866534
8.	NET RAILWAY OPERATING INCOME	931635	1288649	1172528	1677537	1899183	2042446	2098055	2109253	1868365	1845999
9.	OTHER INCOME	552316	558561	564806	571052	577297	583542	589787	596032	602277	608522
10.	TOTAL INCOME	1483951	1847210	1737334	2248589	2476480	2625988	2687842	2705285	2470642	2454521
11.	MISCELLANEOUS DEDUCTIONS FROM INCOME	75124	75962	76799	77637	78474	79312	80149	80987	81824	82662
12.	INCOME AVAILABLE FOR FIXED CHARGES	1408827	1771248	1660535	2170952	2398006	2546676	2607693	2624298	2388818	2371859
13.	RENT FOR LEASED ROADS & EQUIPMENT	25770	25770	25770	25770	25770	25770	25770	25770	25770	25770
14.	INTEREST ON FUNDED DEBT	702234	832701	887398	977230	1149716	1320927	1459023	1575688	1593611	1727079
15.	INTEREST ON UNFUNDED DEBT	11142	11142	11142	11142	11142	11142	11142	11142	11142	11142
16.	TOTAL FIXED CHARGES**	739146	869613	924310	1014142	1186628	1357839	1495935	1612600	1630523	1763991
17.	ORDINARY INCOME	669681	901635	736225	1156810	1211378	1188837	1111758	1011698	758295	607868
18.	EXTRAORDINARY & PRIOR PERIOD ITEMS	0	0	0	0	0	0	0	0	0	0
19.	NET INCOME	669681	901635	736225	1156810	1211376	1188837	1111758	1011698	758295	607868

** INCLUDES CONTINGENT INTEREST AND AMORTIZATION OF DISCOUNT ON FUNDED DEBT

SCHEDULE 1-C(1)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

FUNDS FLOW ITEM	1976	1977	1978	1979	PROJECTED FUNDS FLOW 1980	1981	1982	1983	1984	1985
SOURCES OF FUNDS										
FUNDS FROM OPERATIONS:										
NET INCOME	669621	951635	736225	1156810	1211378	1188837	1111758	1011698	758295	607868
ADD:										
NON-CASH CHARGES FOR:										
ROAD PROPERTY AND EQUIPMENT DEPRECIATION	809223	890565	941119	1017087	1137827	1258859	1369749	1476421	1541274	1671723
ROAD PROPERTY AND EQUIPMENT RETIREMENTS	11559	11559	11559	11559	11559	11559	11559	11559	11559	11559
TOTAL DEPRECIATION AND RETIREMENTS	820782	902124	952678	1028646	1149386	1270418	1381308	1487980	1552833	1683282
INCREASES/DECREASES (-) TO ALL RESERVES	74434	35460	35461	35458	35460	35461	35460	35461	35460	35458
INTEREST IN DEFAULT	149	149	149	149	149	149	149	149	149	149
DEFERRED FEDERAL INCOME TAX	218378	244121	239503	377462	395548	388217	361959	327995	244922	193629
DEDUCT:										
EQUITY IN EARNINGS OF AFFILIATED COMPANIES	0	0	0	0	0	0	0	0	0	0
TOTAL FUNDS FROM OPERATIONS	1783364	2133489	1964016	2598525	2791921	2883082	2890634	2863283	2591659	2520386
ADD OTHER SOURCES OF FUNDS:										
DECREASE IN WORKING CAPITAL	0	0	0	0	0	0	0	0	0	0
DECREASE IN INVESTMENT IN SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN MISCELLANEOUS PROPERTY	0	7054	7055	7054	7054	7056	7054	7054	7055	7054
DECREASE IN MISCELLANEOUS ASSETS	0	0	0	0	0	0	0	0	0	0
INCREASE IN FUNDED DEBT	0	0	0	0	0	0	0	0	0	0
INCREASE IN EQUIPMENT OBLIGATIONS	1166329	1192129	423219	981962	1649003	1515249	1204536	1001798	87613	1144416
INCREASE IN OTHER NON-CURRENT LIABILITIES**	42124	38044	38045	38044	38045	38044	38045	38044	38045	38044
INCREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
INCREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
INCREASE IN OTHER LIABILITIES	0	0	0	0	0	0	0	0	0	0
SALE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
INCREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS CREDITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF FUNDS	2991817	3370716	2432335	3625585	4486023	4443431	4140269	3910179	2724372	3709900

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

SCHEDULE 1-D(1)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED FUNDS FLOW
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

FUNDS FLOW ITEM	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
					PROJECTED FUNDS FLOW					
APPLICATIONS OF FUNDS										
PAYMENT OF DIVIDENDS	472193	456315	463532	470750	477966	485187	492402	499618	506837	514054
INCREASE IN WORKING CAPITAL	261287	193622	152191	172725	184661	172453	160138	172339	23098	185173
INCREASE IN INVESTMENT IN SECURITIES	71933	71933	71933	71933	71933	71933	71933	71933	71933	71933
INCREASE IN INVESTMENT IN TRANSPORTATION PROPERTY	3263898	3103398	2326535	3014212	4226691	4286562	4060401	4006291	2938590	4719475
INCREASE IN MISCELLANEOUS PROPERTY	29253	0	0	0	0	0	0	0	0	0
INCREASE IN MISCELLANEOUS ASSETS	4986	21077	21076	21078	21078	21077	21078	21077	21080	21077
DECREASE IN FUNDED DEBT	118949	103098	62939	149605	110419	74825	61787	56986	105950	0
DECREASE IN EQUIPMENT OBLIGATIONS	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER NON-CURRENT LIABILITIES**	0	0	0	0	0	0	0	0	0	0
DECREASE IN RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
DECREASE IN DEBT IN DEFAULT	0	0	0	0	0	0	0	0	0	0
DECREASE IN OTHER LIABILITIES	218467	294270	239652	377611	395697	388366	362108	328144	245071	193778
REPURCHASE OF CAPITAL STOCK	0	0	0	0	0	0	0	0	0	0
DECREASE IN CAPITAL SURPLUS	0	0	0	0	0	0	0	0	0	0
NET MISCELLANEOUS DEBITS TO RETAINED INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF FUNDS	4450964	4243713	3337863	4277914	5488447	5500403	5229847	5156388	3912559	5705490
NET DIFFERENCE (SHORTFALL)	1459147	872997	905525	652329	1002424	1056972	1089578	1246209	1188187	1995590

NOTE: SHORTFALLS ARE NOT CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN.,E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

** INCLUDES MISCELLANEOUS OBLIGATIONS OTHER THAN BONDS AND AMOUNTS PAYABLE TO AFFILIATED COMPANIES.

SCHEDULE 1-E(1)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED FINANCIAL RATIOS
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(INFLATED)

RATIO NO. FINANCIAL RATIOS ITEM					PROJECTED FINANCIAL RATIOS						
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1976-85 AVERAGE
(1) WORKING CAPITAL (MILLIONS OF DOLLARS)	1005	1242	1415	1578	1757	1935	2101	2268	2365	2469	1903
(2) AVERAGE DAILY WORKING CAPITAL COVERAGE	31	33	33	35	35	36	36	35	36	34	34
(3) OPERATING RATIO (INCLUDING NET EQUIPMENT RENTS)	83.60%	82.05%	84.09%	81.30%	81.40%	81.93%	82.80%	83.77%	85.23%	86.26%	83.20%
(4) OPERATING RATIO (EXCLUDING NET EQUIPMENT RENTS)	78.59%	76.71%	78.53%	75.56%	75.20%	75.27%	75.73%	76.25%	77.50%	78.01%	76.53%
(5) FIXED AND CONTINGENT CHARGE COVERAGE	2.35	2.55	2.19	2.70	2.52	2.31	2.11	1.93	1.69	1.51	2.17
(6) TURNOVER OF TRANSPORTATION INVESTMENT	0.52	0.60	0.62	0.66	0.67	0.67	0.67	0.68	0.65	0.67	0.66
(7) CASH FLOW (MILLIONS OF DOLLARS)	1490	1904	1689	2185	2361	2459	2493	2500	2311	2291	2232
(8) THROW-OFF TO DEBT RATIO	1.97	2.06	1.90	2.06	2.02	1.94	1.80	1.64	1.40	1.54	1.82
(9) RATIO OF ORDINARY INCOME TO OPERATING REVENUES	6.33%	7.32%	5.40%	7.61%	7.20%	6.49%	5.61%	4.72%	3.49%	2.57%	5.60%
(10) RATIO OF DEPRECIATION TO LONG TERM DEBT DUE IN ONE YEAR	1.07	1.02	1.06	0.96	0.97	0.99	0.99	0.97	0.94	1.12	1.00
(11) CAPITAL STRUCTURE RATIO	39.93%	40.44%	39.66%	39.65%	40.37%	40.81%	40.81%	40.51%	39.28%	39.07%	40.07%
(12) RATE OF RETURN ON NET INVESTMENT IN RAILROAD PROPERTY	5.08	4.24	3.60	4.85	5.07	5.00	4.77	4.49	3.80	3.58	4.38
(13) RATE OF RETURN ON TOTAL CAPITALIZATION	5.48%	6.27%	5.47%	6.75%	6.87%	6.67%	6.32%	5.95%	5.16%	4.87%	6.04%
(14) RATE OF RETURN ON TOTAL SHAREHOLDERS EQUITY	4.41%	5.41%	4.11%	6.04%	5.85%	5.30%	4.60%	3.90%	2.76%	2.08%	4.45%
(15) DIVIDEND PAYOUT RATIO	68.%	49.%	61.%	39.%	38.%	39.%	43.%	48.%	65.%	82.%	51.%
(16) OPERATING INCOME PROFIT MARGIN	5.91%	7.01%	5.77%	7.40%	7.57%	7.47%	7.11%	6.62%	5.81%	5.32%	6.68%

SCHEDULE 1-F(I)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL

% INCREASE IN REVENUE OR DECREASE IN EXPENSES
NEEDED TO ELIMINATE SHORTFALL OVER 9 YEARS

FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

	1977	1978	1979	1980	1981	1982	1983	1984	1985
PROJECTED DATA:									
TOTAL REVENUE	18374576	20306107	22661583	25092364	27338713	29519477	31882646	32167307	34723438
TOTAL EXPENSES	14095249	15947290	17122826	18869545	20578058	22355648	24311133	24930108	27086888
SHORTFALL	872997	905525	652329	1002424	1056972	1089578	1246209	1188187	1995590
INCREASED REVENUE OPTION:									
INCREASE REQUIRED = 4.1%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	872997	905525	652329	1002424	1056972	1089578	1246209	1188187	1995590
DECREASE IN SHORTFALL AFTER INCREASING REVENUE 4.1%	759817	839688	937091	1037607	1130497	1220675	1318396	1330167	1435867
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	113180	65837	-284762	-35183	-73525	-131097	-72187	-141980	559723
DECREASED EXPENSE OPTION:									
DECREASE REQUIRED = 5.4%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	872997	905525	652329	1002424	1056972	1089578	1246209	1188187	1995590
DECREASE IN SHORTFALL AFTER DECREASING EXPENSES 5.4%	761431	861479	924982	1019341	1111635	1207661	1313298	1346735	1463245
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	111566	44046	-272653	-16917	-54663	-118083	-67089	-158548	532345

NOTE: THE ABOVE CALCULATIONS ARE BASED ON A REVENUE INCREASE OR EXPENSE DECREASE EFFECTIVE JANUARY 1,1977

SCHEDULE 4-F(1)

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO.

% INCREASE IN REVENUE OR DECREASE IN EXPENSES
NEEDED TO ELIMINATE SHORTFALL OVER 9 YEARS

FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

	1977	1978	1979	1980	1981	1982	1983	1984	1985
PROJECTED DATA:									
TOTAL REVENUE	10726024	11918839	13329949	14788801	16136841	17540515	19113060	19424502	21115952
TOTAL EXPENSES	8185658	9290440	9984800	11045716	12070616	13186060	14439813	14794232	16171789
SHORTFALL	336200	325420	160527	336962	420190	427909	529781	441262	858641
INCREASED REVENUE OPTION:									
INCREASE REQUIRED = 2.7%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	336200	325420	160527	336962	420190	427909	529781	441262	858641
DECREASE IN SHORTFALL AFTER INCREASING REVENUE 2.7%	285608	317370	354944	393790	429685	467062	508935	517228	562267
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	50592	8050	-194417	-56828	-9495	-39153	20846	-75966	296374
DECREASED EXPENSE OPTION:									
DECREASE REQUIRED = 3.5%									
REVISED PROJECTIONS:									
PRESENT SHORTFALL	336200	325420	160527	336962	420190	427909	529781	441262	858641
DECREASE IN SHORTFALL AFTER DECREASING EXPENSES 3.5%	287695	326524	350928	388216	424237	463441	507506	519962	568378
REMAINING SHORTFALL ("-" INDICATES SURPLUS)	48505	-1104	-190401	-51254	-4047	-35532	22275	-78700	290263

NOTE: THE ABOVE CALCULATIONS ARE BASED ON A REVENUE INCREASE OR EXPENSE DECREASE EFFECTIVE JANUARY 1,1977

SCHEDULE 1-A(I)

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	BALANCE SHEET ITEM					PROJECTED BALANCE SHEET					
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	CURRENT ASSETS	5126167	5991994	6674822	7444596	8271152	9044077	9773382	10562712	10682695	11534890
2.	SPECIAL FUNDS	211244	213429	215615	217801	219987	222174	224360	226545	228732	230917
3.	INVESTMENTS	3570829	3642762	3714695	3786628	3858561	3930494	4002427	4074360	4146293	4218226
4.	TOTAL TRANSPORTATION PROPERTY-ROAD & EQUIPMENT	33359232	35796049	37456455	39801196	43351541	46954226	50322263	53626817	55853444	59849920
5.	ACCRUED DEPRECIATION AND AMORTIZATION OF TRANSPORTATION PROPERTY	-8190334	-8425877	-8712426	-9071601	-9544641	-10131186	-10820126	-11606369	-12447239	-13407522
6.	TOTAL TRANSPORTATION PROPERTY (NET)	25168898	27370172	28744029	30729595	33806900	36823044	39502137	42020448	43406205	46442398
7.	MISCELLANEOUS PHYSICAL PROPERTY (NET)	412151	405097	398042	390988	383934	376878	369824	362770	355715	348661
8.	OTHER ASSETS & DEFERRED CHARGES .	382382	401274	420165	439056	457950	476846	495732	514624	533517	552409
9.	TOTAL ASSETS	34871671	38024728	40167369	43008664	46998484	50873507	54367862	57761459	59353157	63327501
10.	CURRENT LIABILITIES	3980497	4652702	5183339	5780386	6422283	7022755	7591922	8208913	8305798	8972820
11.	LONG-TERM DEBT DUE WITHIN ONE YEAR	755909	873770	886872	1059016	1171458	1267410	1386055	1520540	1646653	1486646
	LONG-TERM DEBT DUE AFTER ONE YEAR:										
12.	FUNDED DEBT UNMATURED	3484495	3396891	3341386	3198485	3093494	3023440	2963556	2902372	2804160	2804160
13.	EQUIPMENT OBLIGATIONS	5380274	6454542	6864659	7674477	9211038	10630335	11716226	12583539	12545039	13849462
14.	OTHER NON-CURRENT LIABILITIES	1010309	1032859	1063472	1094810	1127427	1160700	1196842	1233084	1269391	1307435
15.	RECEIVERS AND TRUSTEES SECURITIES	0	0	0	0	0	0	0	0	0	0
16.	DEBT IN DEFAULT	2340	2340	2340	2340	2340	2340	2340	2340	2340	2340
	RESERVES:										
17.	PENSION, WELFARE, INSURANCE CASUALTY & OTHER RESERVES ..	538943	574403	609864	645322	680782	716243	751703	787164	822624	858082
18.	OTHER LIABILITIES AND DEFERRED CREDITS	3719714	3719714	3719714	3719714	3719714	3719714	3719714	3719714	3719714	3719714
	SHAREHOLDERS EQUITY:										
19.	CAPITAL STOCK	4052381	4052381	4052381	4052381	4052381	4052381	4052381	4052381	4052381	4052381
20.	CAPITAL SURPLUS	2026833	2026833	2026833	2026833	2026833	2026833	2026833	2026833	2026833	2026833
21.	RETAINED INCOME-BEGINNING YEAR .	8263341	9919976	11238293	12416511	13754900	15490734	17251356	18960290	20718579	22158224
22.	PLUS OR MINUS NET INCOME AND MISCELLANEOUS CREDITS/DEBITS....	2128828	901635	736225	1156810	1211378	1188837	1111758	1011698	758295	607868
23.	MINUS CASH DIVIDENDS............	472193	456315	463532	470750	477968	485187	492402	499618	506837	514054
24.	PLUS SHORTFALL***	1459147	872997	905525	652329	1002424	1056972	1089578	1246209	1188187	1995590
25.	RETAINED INCOME-END OF YEAR.....	9919976	11238293	12416511	13754900	15490734	17251356	18960290	20718579	22158224	24247628
26.	TOTAL SHAREHOLDERS EQUITY.........	15999190	17317507	18495725	19834114	21569948	23330570	25039504	26797793	28237438	30326842
27.	TOTAL LIABILITIES AND SHAREHOLDERS EQUITY......	34871671	38024728	40167369	43008664	46998484	50873507	54367862	57761459	59353157	63327501

*** SHORTFALLS ARE ADDED TO RETAINED INCOME SO THAT THEY WILL NOT BE CARRIED FORWARD FROM YEAR TO YEAR AS ASSUMPTION IS MADE THAT SOME TYPE OF CORRECTIVE ACTION WILL BE TAKEN,,E.G., RATE INCREASE, OPERATING EXPENSE AND CAPITAL EXPENDITURE REDUCTIONS, GOVERNMENT GRANTS AND SUBSIDIES, DIVIDEND REDUCTIONS, ETC.

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 4-A(I)
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	BALANCE SHEET ITEM	1976	1977	1978	1979	PROJECTED BALANCE SHEET 1980	1981	1982	1983	1984	1985
	CURRENT LIABILITIES	2153574	2519828	2813564	3136119	3488597	3818364	4155333	4533180	4616306	5025045
	TIMES FACTOR(BY REGION)	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
	EQUALS MINIMUM CURRENT ASSETS	2670431	3124586	3488819	3888787	4325860	4734771	5152612	5621143	5724219	6231055
	PRESENT CURRENT ASSETS	2157613	2275568	2314381	2553822	2653933	2642654	2632586	2571336	2233150	1881345
	PLUS PREVIOUS NET SHORTFALLS	0	512818	849018	1174438	1334965	1671927	2092117	2520026	3049807	3491069
	EQUALS ADJUSTED CURRENT ASSETS	2157613	2788386	3163399	3728260	3988898	4314581	4724703	5091362	5282957	5372414
	SHORTFALL (TO BE ADDED TO CASH) ("0" INDICATES NO SHORTFALL)	512818	336200	325420	160527	336962	420190	427909	529781	441262	858641
	PRESENT CASH	337340	125624	-77378	-108955	-317445	-620666	-939077	-1339041	-1765402	-2497198
	PLUS PREVIOS NET SHORTFALLS (WHICH WILL INCREASE CASH)	0	512818	849018	1174438	1334965	1671927	,2092117	2520026	3049807	3491069
	EQUALS ADJUSTED CASH	337340	638442	771640	1065483	1017520	1051261	1153040	1180985	1284405	993871
	EQUALS MINIMUM NEW CASH FIGURE	850158	974642	1097060	1226010	1354482	1471451	1580949	1710766	1725667	1852512

SCHEDULE 3-A(I)

CLASS I LINE-HAUL RAILROADS-SOUTHERN DISTRICT
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	BALANCE SHEET ITEM						PROJECTED BALANCE SHEET				
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	CURRENT LIABILITIES	817714	949471	1053569	1166008	1289928	1409411	1521523	1636780	1662771	1801174
	TIMES FACTOR(BY REGION)	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
	EQUALS MINIMUM CURRENT ASSETS	1063028	1234312	1369639	1515810	1676906	1832234	1977979	2127814	2161602	2341526
	PRESENT CURRENT ASSETS	428826	282603	96161	-55093	-294354	-536984	-804230	-1105446	-1560058	-2113662
	PLUS PREVIOUS NET SHORTFALLS	0	634202	951709	1273478	1570903	1971260	2369218	2782209	3233260	3721660
	EQUALS ADJUSTED CURRENT ASSETS	428826	916805	1047870	1218385	1276549	1434276	1564988	1676763	1673202	1607998
	SHORTFALL (TO BE ADDED TO CASH) ("0" INDICATES NO SHORTFALL)	634202	317507	321769	297425	400357	397958	412991	451051	488400	733528
	PRESENT CASH	-419341	-716096	-1009971	-1297248	-1681011	-2061366	-2458227	-2890076	-3367193	-4081810
	PLUS PREVIOUS NET SHORTFALLS (WHICH WILL INCREASE CASH)	0	634202	951709	1273478	1570903	1971260	2369218	2782209	3233260	3721660
	EQUALS ADJUSTED CASH	-419341	-81894	-58262	-23770	-110108	-90106	-89009	-107867	-133933	-360150
	EQUALS MINIMUM NEW CASH FIGURE	224861	235613	263507	273655	290249	307852	323982	343184	354467	373378

CLASS I LINE-HAUL RAILROADS-ALL DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL — SCHEDULE 1-A(C)
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	BALANCE SHEET ITEM				PROJECTED BALANCE SHEET						
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	CURRENT LIABILITIES	3602825	3868262	3954603	4048082	4284289	4460924	4590771	4710159	4513277	4632777
	TIMES FACTOR(BY REGION)	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
	EQUALS MINIMUM CURRENT ASSETS	4467503	4796644	4903707	5019621	5312518	5531545	5692556	5840597	5596463	5744643
	PRESENT CURRENT ASSETS	3292610	2823346	2314813	1736428	1070766	361452	-333215	-1050225	-2123208	-3154406
	PLUS PREVIOUS NET SHORTFALLS	0	1174893	1973298	2588894	3283193	4241752	5170093	6025771	6890822	7719671
	EQUALS ADJUSTED CURRENT ASSETS	3292610	3998239	4288111	4325322	4353959	4603204	4836878	4975546	4767614	4565265
	SHORTFALL (TO BE ADDED TO CASH) ("0" INDICATES NO SHORTFALL)	1174893	798405	615596	694299	958559	928341	855678	865051	828849	1179378
	PRESENT CASH	190248	-532339	-1129079	-1803546	-2694620	-3576960	-4406892	-5251228	-6159538	-7323065
	PLUS PREVIOS NET SHORTFALLS (WHICH WILL INCREASE CASH)	0	1174893	1973298	2588894	3283193	4241752	5170093	6025771	6890822	7719671
	EQUALS ADJUSTED CASH	190248	642554	844219	785348	588573	664792	763201	774543	731284	396606
	EQUALS MINIMUM NEW CASH FIGURE	1365141	1440959	1459815	1479647	1547132	1593133	1618879	1639594	1560133	1575984

SCHEDULE 2-A(3)

CLASS I LINE-HAUL RAILROADS-EASTERN DISTRICTS, EXCLUDING BANKRUPT CARRIERS & CONRAIL
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-INFLATED)

LINE NO.	BALANCE SHEET ITEM	1976	1977	1978	1979	PROJECTED BALANCE SHEET 1980	1981	1982	1983	1984	1985
	CURRENT LIABILITIES	1009204	1183403	1316206	1478259	1643758	1794980	1915066	2038953	2026721	2146601
	TIMES FACTOR(BY REGION)	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
	EQUALS MINIMUM CURRENT ASSETS	1392708	1633096	1816364	2039997	2268386	2477072	2642791	2813755	2796874	2962309
	PRESENT CURRENT ASSETS	1080581	1101679	1026611	1055867	1019151	989013	906054	811641	536235	298249
	PLUS PREVIOUS NET SHORTFALLS	0	312127	531417	789753	984130	1249235	1488059	1736737	2002114	2260639
	EQUALS ADJUSTED CURRENT ASSETS	1080581	1413806	1558028	1845620	2003281	2238248	2394113	2548378	2538349	2558888
	SHORTFALL (TO BE ADDED TO CASH) ("0" INDICATES NO SHORTFALL)	312127	219290	258336	194377	265105	238824	248678	265377	258525	403421
	PRESENT CASH	291079	175875	1173	-89235	-255601	-406044	-587495	-780872	-1055031	-1393350
	PLUS PREVIOS NET SHORTFALLS (WHICH WILL INCREASE CASH)	0	312127	531417	789753	984130	1249235	1488059	1736737	2002114	2260639
	EQUALS ADJUSTED CASH	291079	488002	532590	700518	728529	843191	900564	955865	947083	867289
	EQUALS MINIMUM NEW CASH FIGURE	603206	707292	790926	894895	993634	1082015	1149242	1221242	1205608	1270710

CLASS I LINE-HAUL RAILROADS-WESTERN DISTRICT, EXCLUDING CHICAGO, ROCK ISLAND & PACIFIC R.R. CO. SCHEDULE 6-B(C)
PROJECTED BALANCE SHEET
FOR THE YEARS ENDING DECEMBER 31, 1976-1985
(THOUSANDS OF DOLLARS-CONSTANT-1975)

LINE NO.	BALANCE SHEET ITEM	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
						PROJECTED BALANCE SHEET					
	CURRENT LIABILITIES	1956990	2109448	2167315	2222907	2356804	2457633	2547504	2638827	2549390	2637859
	TIMES FACTOR(BY REGION)	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
	EQUALS MINIMUM CURRENT ASSETS	2426667	2615715	2687470	2756404	2922436	3047464	3158904	3272145	3161243	3270945
	PRESENT CURRENT ASSETS	1952613	1810903	1677732	1497360	1280489	985959	732549	463747	24240	-368571
	PLUS PREVIOUS NET SHORTFALLS	0	474054	804812	1009738	1259044	1641947	2061505	2426355	2808398	3137003
	EQUALS ADJUSTED CURRENT ASSETS	1952613	2284957	2482544	2507098	2539533	2627906	2794054	2890102	2832638	2768432
	SHORTFALL (TO BE ADDED TO CASH) ("0" INDICATES NO SHORTFALL)	474054	330758	204926	249306	382903	419558	364850	382043	328605	502513
	PRESENT CASH	305370	22149	-170653	-407453	-748945	-1140223	-1483916	-1846369	-2216761	-2701525
	PLUS PREVIOS NET SHORTFALLS (WHICH WILL INCREASE CASH)	0	474054	804812	1009738	1259044	1641947	2061505	2426355	2808398	3137003
	EQUALS ADJUSTED CASH	305370	496203	634159	602285	510099	501724	577589	579986	591637	435478
	EQUALS MINIMUM NEW CASH FIGURE	779424	826961	839085	851591	893002	921282	942439	962029	920242	937991

APPENDIX L

Report on Commission staff study of the cost of equity capital

Presented elsewhere (appendix J, Forecast Methodology No. 12) is an explanation of the Commission staff's projected cost of debt capital. The study of the cost of equity capital discussed below was conducted earlier, before 1974 data were available. In projected funds flow analysis the cost of equity capital does not enter directly, though the analysis does require some assumptions as to dividends policy. Rather, the estimated cost of equity capital may be used as a standard or benchmark against which one may compare the returns on shareholders' equity yielded by the projected funds flow model. In the framework of rate of return regulation followed in public utility ratemaking, one may also combine the costs of debt and equity to obtain a standard against which to compare the return on net investment.

In practice the problem of measuring the railroads' return on equity is complicated by a host of problems which make comparability with financial reports of other firms most difficult. This requires examination of data other than simple return on equity data to establish comparability of both the data and the levels of risk facing the railroad and the alternative investment possibilities against which it is being compared. In this report, the problem affecting comparability of rail financial data with financial data from firms in other industries are discussed. A methodology is presented to provide a means of comparing rail data with financial data from other industries which does not depend exclusively on the value of shareholder equity. Comparisons are made between several railroads earnings and accounting profits, on the one hand, and, on the other, the earnings and profits of aggregates of industrial and utility firms. Most significantly, while the cost of equity capital is definable in a spot or external funding situation, as applied to longrun internal financing it is based on longrun average return on the value of shareholder equity including whatever adjustment for price level expectations exists.

Problems associated with railroad equity measures—The nature and age of a typical railroad's investment make the valuation of shareholder equity a good deal more arbitrary than for most other firms. Since railroad capital is extremely long-lived, the value of assets on the books does not stand the test of periodic replacement cost the way it does in other firms. Conceptually, replacement cost valuation could solve the problem, but in practice such valuation would be highly impracticable to determine with any real accuracy.[1] The equipment in use at the turn of the century required a different technology than the equipment in use today. The costs of the changes which took place resulted in a set of accounts which partially reflected a writeoff, and partly reflected depreciation of assets long before made uesless by changing technology. Bankruptcy of many of the roads at some time since their founding further modified the equity and accounts structure of the railroads. The use of betterment rather than depreciation accounting for many railroad investments results in figures for both gross investment and equity investment which are inconsistent with similar figures for firms using depreciation accounts.[2]

---

[1] For discussions of the original and reproduction cost basis of ratemaking and some of the problems associated with the approaches see Walter Morton, "Rate of Return and the Value of Money in Public Utilities," *Land Economics*, May 1952; Joseph Rose, "Confusion in Valuation for Public Utility Ratemaking", *"Minnesota Law Review,"* vol. 47, 1963.

[2] On this point see Kujawa and Wisniewski, "Depreciation Versus Betterment Accounting for Track Structures," Transportation Research Forum, October 11, 1974.

None of this is to suggest that the return on valuation of shareholder equity is an impossible measure to use, but only that it must be used with care. The approach suggested here avoids total direct reliance on that measure. Rather, one can deduce that a particular railroad's reported return on shareholders' equity is adequate if over a long range of time the railroad's earnings behave consistently with those of other firms. If one selects some railroads whose earnings records compare well with other industries' and whose shareholders' equity is least subject to the foregoing problems, the return on equity experienced by these roads can serve as a reliable standard for the industry.

Valuation models—It is clear that the higher the proportion of earnings reinvested in the firm, the faster the rate of growth in earnings, other things being equal. What this suggests is that equally profitable firms, one of whom pays out a larger portion of earnings in dividends than the other will have different rates of growth in earnings. The firm with the lower dividend payout will have the higher rate of growth in earnings as long as profitable reinvestment opportunities remain to the firms. Typically, growing firms tend to pay out a small percentage of earnings in dividends, and static or contracting firms tend to pay out a higher percentage, however, the practice is by no means consistent from firm to firm. The implication of this factor for comparison of relative earnings is that firms must be compared which have similar dividend payout policies.

For purposes of financing decisions, the rate of growth expected in the future is important to determining the cost of equity capital in the spot or external market. Typically, the faster a firm is expected to grow in the future, the lower the earnings/price ratio, and the lower the dividend which is paid relative to the market price of a share. For a growing firm, the cost of equity capital may be low on the market because a new issue of stock will sell at a high price relative to the amount which must be initially earned per share. As long as the growth raises the expected price of the stock still further, existing stockholders are not likely to oppose such financing. For a company which is not expected to show substantial growth in earnings in the future, there is a smaller stream of expected income discounted back to present in potential investor's minds, and the price of a share of stock relative to a given amount of earnings per share is likely to be lower. In such an instance, the cost of capital on the equity market is likely to be higher. If the market is depressed, the cost of equity capital on the market is higher still.

Recent utility issues of Potomac Electric, VEPCO, and Southern Company cost those companies in the neighborhood of 13 percent of the sale price in annual dividend payout per year. Under such circumstances, internal financing becomes cheaper. Internal financing is based on the average return which an investor expects to earn over time rather than the spot price of capital in the market at a point in time. For a growing company where the expected growth is discounted in the market in the form of higher stock prices, external financing may always be cheaper than internal financing, but in such a case, it is frequently assumed that those who bought the stock want it to appreciate and thus are willing to reinvest their earnings as well. Thus many of the "growth" stocks pay relatively low dividends. Evidence of the railroads indicates that they are generally not rapidly growing firms (but observe the Southern for a possible exception). They tend to pay higher dividends, and have lower growth rates. Another possibility is that some railroads are disinvesting through the medium of high dividends. The period of disinvestment is so much longer for railroad than for almost any other industry that such a practice could continue on for decades.

The choice of what constitutes a reasonable alternative investment to railroad investment is somewhat difficult. A firm which showed a faster rate of growth in earnings than a railroad, but with similar dividend policies might have been considered a riskier investment. The higher earnings could be considered a return to risk taking, and therefore the comparison would not be valid. To get around the problem, the alternatives in this study consist of aggregates of industrial firms and of utilities. Presumably, the two provide upper and lower bounds to risk of railroads which have traditionally been considered conservative investments relative to the industrials, but risky relative to fixed base utilities. Using averages has the advantage of avoiding the question of what is a typical firm. It has the disadvantage, however, of not permitting a choice of alternatives with similar growth patterns or levels of investment.

The data and analytical approaches.—The data used was collected from *Moody's Transportation Manual* and *Moody's Utility Manual*. The data collected for the railroads and the aggregate alternatives includes earnings per share, number of shares, issues and splits, value of shareholder equity, dividends paid, total assets, and annual stock price range. The earnings data was adjusted for splits so that the earnings reflect a return to a share defined in unchanging terms. New issues were allowed to dilute earnings unless the new investment generated additional earnings immediately. These procedures made the data comparable with the aggregated data provided by Moody's service and permitted comparison between the two series.

The Southern Railway Co., Seaboard Coast Line R.R. Co., Chessie System, Norfolk and Western Ry. Co., and Denver & Rio Grande Western R.R. Co. were chosen to reflect different railroads showing accounting profits with relatively straightforward histories. The data for most railroads are not without problems. There have been mergers, takeovers, and abandonments which have resulted in aggregation problems. Railroads have been acquired by holding companies, many of which own nonrail assets. It becomes difficult to secure financial evidence which reflects rail operations and provides a measure of return on railroad investment which is internally consistent over time.

The data were presented in several ways. Rail earnings per share were considered as a long-term measure of firm performance and were compared with average earnings of utilities and industrials by examining the ratios of specific railroad earnings to utility or industrial earnings. The rate and direction of change in the ratio indicates relative rail performance. A rising ratio indicates either that the railroad was earning more per share than its alternative over time, or that it was reinvesting a greater portion of earnings. A decline indicates the opposite.

Relating rail earnings to either utility or industrial earnings by statistical regression analysis provides a measure of how consistently earnings of the railroad changed with the general level of firm earnings, and at what average rate relative to the alernative. Use of such a technique is very limited, because it neglects the differences in reinvestment policy, and the development of secular trends in series. The regression measure is most reliable when coefficients of correlation are high. However, such a measure often gives misleading results. For example, the slope of an equation estimating industrial earnings in terms of utility earnings indicates that industrial earnings equal .006 plus .919 utility earnings. Reversing the relation, utility earnings equal 2.97 plus .905 industrial earnings. This interesting result along with relatively low correlation coefficients convinced us not to use regression summaries.

Utilities pay a higher portion of their earnings out in the form of dividends than do industrials in general. Their increase in price in the past 20 years has been lower than that of industrials. In fact the relationship between utility earnings and industrial earnings appears to be cyclical. Utility earnings appear to be a higher percentage of industrial earnings at the trough of a business cycle and during the first stages of recovery. Earnings for utilities rise less rapidly than industrial earnings up to and probably beyond the peak of the business cycle. A linear regression, even though it explains over 80 percent of the variation does not completely describe the earnings relationships. Railroads, with their pronounced response to business conditions, can be expected to suffer from this phenomena to a greater extent in this sort of comparison.

Analysis of rail earnings data—the Southern Railway.—The special significance of selecting a railroad like the Southern Railway (Southern) for analysis is that it is unlikely to contain a significant amount of obsolete or excess physical plant in the investment base developed according to ICC accounting rules. Hence, its return on equity could be used with some confidence as an indicator of the railroads' cost of capital applicable to internally generated funds. It must be shown first, however, that Southern has not been earning monopoly profits nor earning less than the competitive cost of capital.

The Southern is one of the most successful railroads in the series. Its performance in the market is, therefore, interesting as an indicator of how one of the industry's strongest firms compares to the general level of firm activity in the economy. In general, its performance appears to be good, but not so good as to warrant the description applied by some as an extremely profitable firm. It appears to be well managed and has substituted equipment for labor early by the standards of the industry, is not diversified and has no intention of diversifying.[3] Its performance is generally up to the average of industrial or utility performance.

The Southern has almost doubled the value of its shareholder equity over the past 20 years, from $422 million in 1954 to $739 million in 1973 (see table 1). The price per share over the same period adjusted for splits has risen from $60.5 in 1954 to $200 in 1973. During the same period, dividends rose from $3.50 to $8.85 and earnings per share rose from $8.95 to $20.28. This represents a 227-percent increase in earnings and a 252-percent increase in dividends. This compares against earnings for the average industrial firm which increased from $8.38 to $26.01 and dividends which increased from $4.19 to $10.46, increases of 310 and 234 percent, respectively. Stock prices of the Southern increased 3.3 times compared to 3.7 times for the average industrial firm and 1.6 times for the average utility. The higher dividend and generally lower risk associated with utilities accounts for much of the smaller increase in utility prices.

---

[3] *Dun's*, December 1974, pp. 46-51.

TABLE 1.—*Southern Ry.*

Date	Price			Earnings per share	Issues & splits	Adj. earnings	Dividends	Dividends per share	No. of shares
	High	Low	Av.						
1973	$51	$29	$40	$4.07		$40.70	$27,482,000	$1.77	15,559,015
1972	57	44	50 1/2	3.65	2 for 1 split	36.65	25,743,848	1.60	15,508,342
1971	45 7/8	31 1/8	38 1/2	7.19		35.95	24,792,955	3.20	7,754,171
1970	63 3/4	40	51.9	5.71		28.50	23,923,624	3.20	7,640,793
1969	66	42 1/4	54.1	5.72		28.65	20,694,470	3.00	6,900,580
1968	65 3/4	44 1/2	55.1	4.65		23.25	20,080,640	3.00	6,701,154
1967	57 3/4	42 3/8	50.1	5.46		27.40	18,692,054	2.80	6,681,271
1966	65 7/8	39 3/4	52.8	4.63		23.15	18,615,535	2.80	6,668,746
1965	60 1/2	51 1/2	56	4.58		22.90	18,559,982	2.80	6,628,565
1964	73	55 7/8	64.4	4.89		24.45	18,559,982	2.80	6,628,565
1963	68	55 1/4	61.6	4.53		22.65	18,557,602	2.80	6,628,565
1962	59 3/8	44	51.7	4.79		23.95	18,563,062	2.80	6,626,665
1961	61 1/2	47 3/4	54.6	3.98		19.90	18,296,912	2.80	6,647,415
1960	54 1/2	40	47.3	4.31		21.55	18,043,207	2.80	6,422,315
1959	60 3/4	48 1/4	54.4	4.65		23.25	18,166,092	2.80	6,478,465
1958	56	30	43	4.20		21.00	18,119,892	2.80	6,477,065
1957	45 7/8	28 1/8	37.7	4.78		23.90	18,174,800	2.80	6,487,100
1956	49 3/8	38 1/2	43.9	5.52	2 1/2 for 1 split	27.60	16,876,600	2.60	6,491,000
1955	112	72 3/4	92.4	13.47		26.94	10,385,600	4.00	2,596,400
1954	81 3/4	39 1/4	60.5	8.95		17.90	8,087,410	3.50	2,596,400
1953	[1]49 7/8	[1]38	43.9	11.62	2 for 1 split	23.24	4,868,252	1.88	2,596,400

[1]After split

TABLE 1.—*Southern Ry.*—Continued

Date	Total¹ assets	Value of shareholder equity	Earnings ratios		Earnings	Earnings	Dividends
			Rail/Industrial	Rail/Utilities	Equity	Price	Earnings
1973	$1,413,522	$738,695	$156.5	$539.1	$8.57	$10.2	$0.43
1972	1,356,505	703,352	180.7	474.1	8.08	7.22	.45
1971	1,316,111	674,855	204.5	503.5	8.26	18.68	.45
1970	1,249,434	639,656	186.3	413.6	6.82	10.98	.56
1969	1,168,347	585,973	163.4	414.0	6.75	10.59	.52
1968	1,099,403	579,403	132.3	348.6	5.38	8.44	.65
1967	1,027,421	569,437	173.9	410.8	6.43	10.94	.51
1966	999,695	553,056	138.0	367.5	5.58	8.77	.60
1965	964,466	540,352	139.5	386.8	5.61	8.18	.61
1964	941,204	530,392	170.4	451.9	6.11	7.59	.57
1963	937,397	516,534	182.2	458.9	5.81	7.35	.62
1962	889,654	507,828	215.8	506.3	6.25	9.26	.58
1961	871,496	490,807	207.1	459.6	5.39	7.29	.70
1960	845,152	476,058	224.0	523.1	5.81	9.11	.65
1959	831,214	469,055	236.0	608.6	6.43	8.53	.60
1958	825,324	465,747	252.7	578.5	5.84	9.77	.66
1957	820,487	457,165	232.7	700.9	6.78	12.92	.59
1956	811,799	441,389	266.7	823.9	8.12	12.57	.47
1955	856,148	422,492	256.3	839.3	8.28	14.58	.30
1954	821,110	398,163	213.6	608.8	5.84	14.79	.39
1953	815,611		301.4	836.0			

From annual reports filed with I.C.C.

All of this suggests that the Southern is earning a fair return on its investment, but is not making more than a "fair return" from its rail operations. For unless the typical firm in the sample is earning monopoly or oligopoly rents, the Southern is not.

The two rates of return of interest are the return on value of shareholder equity which ranged from 5.39 to 8.57, and earnings as a percentage of price which ranged from 7.22 to 18.68, ironically the high occurring in 1971 and the low in 1972. We have previously argued that the return on value of shareholder's equity is less reliable for a railroad than for most firms. Because of the Southern's record in maintaining and upgrading its physical plant, however, the firm is likely to be more consistent with a typical industrial firm than most railroads. As a result, a return on internally generated funds in this area is likely to be adequate to induce investors to keep their money in the firm. The average over the past 20 years has been 6.60-percent return on value of equity, and 10.38-percent return on average annual market price. The expected rate of increase in the price level has probably been internalized in both interest rates in the 1971 to 1973 period. A similar period of higher interest rates can be traced to the economic downturns in the mid-50's to early 60's. This suggests that for the foreseeable future, a rate of 6.75 on internally generated funds is on the low side, and a figure of between 8 and 8.5 percent is more appropriate at least as long as the economic recession and inflation problems persist.

The cost of secondary issues is a function of the market price of the stock at the time of the issue. At a stock price of $40 per share, however, the cost, assuming no dilution of existing shareholders investment, ranges in the area of 10 percent. For railroads which are less highly thought of in the market, the cost of secondary issues is likely to remain higher than this level, particularly in the near future. The 20-year average earnings price percentage was 10.4 percent, and the 10-year average was 10.2 percent, thus if the road can time its issue, a 10-percent cost of equity capital from this source is a reasonable estimate. If the financing is on a rush basis, however, the rate could also be expected to be somewhat higher but this would reflect the greater risk associated with the investment. This assumes that the rate of increase in prices is falling. The higher rates of interest experienced in the mid-50's are probably a reflection of the sharp rises in the price level at that time. If the price level increases further, both the appropriate rate of interest on internally generated funds and on spot funds from secondary issues can be expected to increase to recompense investors for the expected deterioration in the real value of their monetarily denominated assets.

The Denver and Rio Grande Western.—The Denver and Rio Grande Western Railroad (D&RGW) exhibits many of the same characteristics as the Southern. A major complication in the analysis has been the shift from a railroad corporation to a holding company which owns the railroad. The peculiar nature of the stock exchange, and a notable change in earnings per share data prompted an analysis which included a reconciliation of the data reported to the Interstate Commerce Commission, and the Rio Grande Industries data. The specific problem is that the holding company exhibits a marked fall in the earnings as a percentage of shareholder equity beginning with 1970, the year of acquisition. While the Southern demonstrated increases in return on equity during the period, the D&RGW, which had financial experience parallel to the Southern in this respect up to 1970, did not. The values for the last 4 years were 4.63 for 1970, 5.68, 5.87, and 5.68 for the years 1971 to 1973. Going back to the reports of the Commission, and recomputing earnings as a percentage of shareholder equity yielded 7.3, 8.1, 8.5, and 8.8 for the same 4-year period, consistent with Southern's experience (see table 2). The same problems associated with accounting and adjustment for series consistency influence the adjusted earnings data for those 4 years.

TABLE 2.—*Denver & Rio Grande Western*

Date	Price			Earnings per share		Issues & splits	Adj. earnings	Dividends	Dividends per share	No. of shares
	High	Low.	Av.							
1973	$17 3/4	$9 1/2	$13.6	$2.49	[5]($2.85)		$38.47	$2,517,000	$0.60	[1]4,079,127
1972	25 3/4	16	20.9	2.39	[5](2.69)		36.31	2,483,000	.60	[1]4,179,949
1971	25 7/8	13 3/4	19.8	2.25	[5](2.45)		33.08	2,417,000	.60	[1]4,091,960
1970	[2]20 1/4	13 5/8	16.9	1.75	[5](2.13)	holding company acquired railroad	28.75	1,798,000	.60	[1]4,087,160
1969	[2]28 1/2	15 1/2	22.0	1.82			16.38	6,964,230	1.10	[1]6,331,118
1968	25	17 1/8	21.1	1.81			16.29	7,005,987	1.10	6,330,518
1967	22 1/8	17 1/8	19.6	1.76			15.84	7,007,647	1.10	6,383,798
1966	25	16 3/4	20.9	2.01			18.09	7,036,581	1.10	6,355,328
1965	22	19 3/8	20.7	1.73			15.57	6,605,457	1.025	6,431,353
1964	24 1/8	19 7/8	22	1.65			14.85	6,440,968	1.00	6,453,468
1963	23	19 1/8	21.1	1.56			14.04	6,421,976	1.00	6,431,153
1962	22 1/8	15 1/2	18.8	1.43			12.87	6,400,749	1.00	6,408,463
1961	22 3/8	16 1/8	19.3	1.37			12.33	6,363,758	1.00	6,382,310
1960	18 1/2	13 7/8	16.2	1.35			12.15	6,327,114	1.00	6,331,372
1959	21	16 3/8	18.7	1.37		3 for 1 split	12.33	6,059,468	[3]1.00	6,323,678
1958	58 7/8	34 1/8	46.5	4.95			14.87	5,221,744	2.50	2,097,471
1957	48 1/4	33 1/2	40.9	6.30			18.90	5,313,149	2.50	2,084,990
1956	48	38 1/2	43.3	5.79			17.37	5,509,518	2.50	2,171,330
1955	43 7/8	36	39.9	5.17		3 for 1 split	15.51	5,274,973	[3]2.50	2,277,900
1954	117 1/4	55 5/8	86.4	13.19			13.19	3,503,130	5.00	799,903
1953	60	55 3/4	57.9	15.40			15.40	3,532,368	6.00	588,728

[1] Common shares in Rio Grande Industries.

[2] From Denver & Rio Grande Western R.R. because of adjustment problems with preferred stock.

[3] Adjusted to reflect split.

Note preferred stocks acquired in conversion.

[5] Adjusted as indicated in text.

TABLE 2.—*Denver & Rio Grande Western*—Continued

Date	Total assets	Value of shareholder equity	Earnings ratios		Earnings		Earnings	Dividends
			Rail/Industrial	Rail/Utilities	Equity		Price	Earnings
							Percent	
1973	[1]$370,457	[1]$178,701	1.479	5.095	$5.68	[2](8.8)	18.31	$0.24
1972	[1]361,910	[1]170,327	1.790	4.697	5.87	[2](8.5)	11.44	.25
1971	[1]332,951	[1]162,032	1.882	4.633	5.68	[2](8.1)	11.36	.27
1970	[1]316,311	[1]154,389	1.879	4.173	4.63	[2](7.3)	10.36	.34
1969	298,153	176,618	.934	2.367	6.52		8.27	.60
1968	293,936	172,191	.927	2.442	6.65		8.58	.61
1967	282,463	168,680	1.005	2.374	6.66		8.98	.63
1966	261,412	144,424	1.078	2.871	8.84		9.62	.55
1965	253,953	139,229	.948	2.630	7.99		8.36	.58
1964	248,730	134,349	1.034	2.744	7.93		7.50	.60
1963	239,371	129,300	1.129	2.813	7.76		7.39	.64
1962	232,874	125,367	1.159	2.720	7.31		7.61	.69
1961	224,530	122,417	1.283	2.847	7.14		7.10	.72
1960	222,045	120,142	1.263	2.949	7.11		8.33	.74
1959	220,936	117,809	1.251	3.228	7.35		7.33	.72
1958	221,297	116,406	1.789	4.096	8.92		10.65	.50
1957	218,422	110,726	1.840	5.543	11.86		15.40	.39
1956	214,565	106,498	1.678	5.185	11.80		13.37	.43
1955	215,581	106,564	1.476	4.832	11.05		12.96	.48
1954	212,124	105,283	1.574	4.486	9.77		15.27	.37
1953	223,899	88,263	1.997	5.540	10.27		26.60	.38

[1] Rio Grande Industries preferred stock netted out.

[2] Denotes adjustment explained in text.

Based on 6,331,118 shares outstanding in 1969, earnings per share for the 4-year period as reported to the Interstate Commerce Commission were 2.13, 2.45, 2.69, and 2.85 for the 4-year period, higher than that shown in the table and reported by Rio Grande Industries. The adjustment of this earnings data for consistency with the time series proved especially vexing. Splits were handled by increasing the earnings to reflect the share as of 1953. In this case, however, the number of shares dropped to 4,087,160 as a result of the takeover. The method of acquiring the stock of the railroad was to offer one share of Industries common and two shares of series A preferred for two shares of railroad common. In 1969, the rail stock price ranged between 15 1/2 and 28 1/2. The Industries common stock price range was from 11 1/2 to 20. The class A preferred price ranged from 9 1/4 to 13 7/8. Thus, one can reasonably argue that the four and a fraction million shares of new common stock were equivalent to the 6 million plus shares of the old stock, any difference having been compensated for in preferred stock. This means that the adjusted earnings per share for the years 1970 to 1974 were $28.75, $33.08, $36.31, and $38.47, respectively. The resulting return on shareholder equity is reported above.

The ratio of rail to industrial and utility earnings is particularly interesting. After a decline in relative earnings that extended to 1969 or 1970, the railroad turned around and increased the ratio to the levels which existed in the mid-50's which were the previous high point for the railroad. The figures shown in the table are the ratios calculated on the basis of the holding company earnings for the past 4 years. The ratios based on the adjusted values relative to industrials for 1970 to 1973 were 1.879, 1.882, 1.790, and 1.479, respectively. Relative to utilities the values were 4.172, 4.633, 4.697, and 5.095. Again, this suggests that the railroad's stock was generally performing as well as industrial or utility stocks. Its dividend record also paralleled that of the Southern, so that this road can be described as earning its opportunity cost of capital.

The D&RGW shows somewhat less variability in rates of return than the Southern, but the same general pattern. The cost of internally generated funds appears to be in the range of 8.5 percent. The spot rate averaged 10.2 percent for the past 10 years, and 10.4 percent for the past 20 years. This suggests that in a normal market a rate of 10.5 percent might be realistic. In the past 3 years, however, the rate has been 11.4, 11.4, and 18.3 percent, suggesting that if this trend continues the cost of capital from a secondary issue could be considerably higher. As in the case of the Southern, the higher rates during the mid-50's indicate a response to continued increases in the price level. If such increases persist into the future, the cost of capital can be expected to rise to recompense investors for their loss due to inflation.

The Norfolk and Western.—The Norfolk and Western Railway Co. (N&W) is generally considered to be a successful railroad by industry standards. It differs from both of the railroads discussed above, however, in that it has not been a growing railroad but rather stable. (This description may not be very apt in the foreseeable future, given the increased importance of coal in the economy.) Perhaps because of its relatively slow growth rate, it has consistently paid a higher percentage of earnings out in the form of dividends. Such behavior is consistent with a firm whose opportunities for growth lie only in the areas of diversification or merger. Similarly, applying the theory of valuation developed above, the rate of growth in earnings should be lower than for a firm which is reinvesting a higher portion of earnings in the firm. This is exactly what is shown by the earnings ratio data (see table 3). Relative to industrial firms, the N&W showed an increase from 1954 through 1963, then began declining relative to the industrials. Concomitant with this decline was a rise in the relative

best copy available

share of earnings paid out in dividends—from an average of 59 percent in the first 10 years, to an average of 70 percent in the 10 years ending in 1973. This compares to the average for the first 10 years for industrials of 58 percent, but an average for the second decade of only 53 percent. Once again the compounding effect of reinvested earnings is apparently at work.

TABLE 3.—*Norfolk & Western Ry.*

Date	Price			Earnings per share	Issues & splits	Adj. earnings	Dividends	Dividends per share	No. of shares
	High	Low	Av.						
1973	$78 7/8	$56	$68	$8.23			$51,449,000	$5.00	10,449,191
1972	85 1/4	65 1/8	75.2	9.21			48,951,559	5.00	9,750,601
1971	85 1/4	66 3/8	75.8	7.90			49,351,033	5.50	9,830,218
1970	85 7/8	49 5/8	67.2	7.69			53,737,191	5.50	9,910,195
1969	100 3/8	75	87.7	8.61			56,147,382	6.00	9,317,897
1968	118 1/4	87 1/8	102.7	7.89			55,094,295	6.50	9,397,897
1967	112 1/4	88 5/8	100.4	8.01			55,137,868	6.50	9,062,485
1966	139 1/4	93 3/4	116.5	10.61			60,301,625	6.50	9,222,280
1965	138 1/4	119 3/4	129	9.68			60,432,615	6.50	9,299,670
1964	150 5/8	113 3/4	132.2	7.86			51,909,954	7.00	9,287,934
1963	125	105	115	9.07			44,380,123	6.00	7,405,833
1962	110 1/2	85 1/4	97.9	8.73			40,571,664	5.50	7,379,543
1961	117	97 1/4	107.1	8.37			36,824,474	5.00	7,370,413
1960	106 1/4	90 1/8	98.2	8.15			36,768,625	5.00	7,356,275
1959	108	84 1/4	96.1	6.88			26,447,961	4.70	7,349,025
1958	92	53 1/4	72.9	7.57			22,503,728	4.00	5,625,932
1957	70 3/4	51 1/2	61.1	7.75			22,503,728	4.00	5,625,932
1956	73 3/4	60 1/8	66.9	7.39			21,097,245	3.75	5,625,932
1955	61 7/8	48 1/4	55	6.70			21,097,245	3.75	5,625,932
1954	51 7/8	39 5/8	45.8	4.52			19,690,762	3.50	5,625,932
1953	53 1/8	39 3/4	46.4	4.83			19,690,762	3.50	5,625,932

TABLE 3.—*Norfolk & Western Ry.*—Continued

Date	Total assets	Value of shareholder equity	Earnings ratios		Earnings	Earnings	Dividends
			Rail/Industrial	Rail/Utilities	Equity	Price	Earnings
1973	$2,200,711	$1,170,420	$0.316	$1.090	$7.35	$12.10	$0.60
1972	2,114,320	1,146,312	.454	1.191	7.83	12.25	.54
1971	2,119,641	1,173,487	.449	1.106	6.62	10.42	.69
1970	2,180,246	1,170,048	.502	1.116	6.51	11.44	.71
1969	2,079,075	1,109,145	.491	1.244	7.23	9.82	.69
1968	2,001,748	1,099,462	.448	1.183	6.74	7.68	.82
1967	1,891,286	999,119	.508	1.201	7.27	7.98	.81
1966	1,848,490	1,007,068	.632	1.684	9.72	9.11	.61
1965	1,705,044	984,595	.590	1.635	9.14	7.50	.67
1964	1,613,804	961,338	.548	1.452	7.59	5.95	.89
1963	1,073,262	766,665	.729	1.818	8.76	7.89	.66
1962	1,013,597	749,971	.786	1.846	8.59	8.91	.63
1961	1,005,047	725,810	.870	1.933	8.50	7.82	.59
1960	989,201	708,289	.847	1.978	8.46	8.30	.61
1959	978,779	684,380	.698	1.801	7.39	7.16	.68
1958	726,172	573,521	.911	2.085	7.43	10.38	.52
1957	697,799	554,372	.755	2.273	7.86	12.68	.54
1956	650,030	534,529	.714	2.206	7.78	11.05	.50
1955	631,302	515,706	.637	2.087	7.31	12.18	.55
1954	596,782	500,143	.539	1.537	5.08	9.87	.77
1953	600,438	499,080	.626	1.737	5.44	10.41	.72

The earnings as a percentage of price data matches very closely with both the Southern and the D&RGW. For the last 4 years, the percentage has been in excess of 10, with the average at 12.10 during 1973. This assumes a price of 68 which is the arithmetic average of the high and low for the year. The rate would have been 10.4 percent relative to the low price and 14.7 percent relative to the high.

The earnings as a percentage of equity data are not completely consistent with that of the other railroads. The values were lower than those of the D&RGW or Southern during the period 1954 to 1958. The values were of the same order of magnitude or a little higher during the 1958 to 1968 period, but during the 1969 to 1973 period they did not rise as fast as the rates of the other two railroads. The 20-year average value was 7.7 percent, higher than the average of 6.6 percent for the Southern, and lower than the 8.4 20-year average of the D&RGW calculated with adjusted earnings data for the 1969 to 1973 period, but about equal to the 7.8 percent for the D&RGW given the unadjusted figures. Over the past 10 years, the 7.6-percent average for the N&W compares with a 6.8-percent value for the Southern and a 7.7-percent value for the D&RGW using adjusted earnings or a 6.6-percent value using unadjusted earnings. The difference is very likely to lie in the differing growth characteristics of these three healthy railroads. The N&W has been a relatively conservative railroad exhibiting little growth over the past 20 years. The D&RGW showed little growth from 1954 to the early 1960's then increased its rate of growth. The Southern has been growing over the past 20 years but has increased its rate of growth in the past 10. A slow growing railroad need not attract much new capital even from internal sources. Its return on shareholders' equity, therefore, need not vary as much with market conditions as the return of a firm financing substantial expansion through internally generated funds. The N&W exhibits a rate higher than the Southern during most of the 1960's, and a lower one during both the 1950's and the 1970's. This is behavior consistent with the above hypothesis. Over long periods of time the average return does not differ much, at least in this case.

As before, the secondary issue market is likely to demand a higher price for capital than the internal funds price. A return of 8 percent or less appears to be adequate for internally generated funds under past growth conditions. In the unlikely event the firm decided to go to the equity market, a rate comparable to the rate the other railroads would have to pay would be demanded of the N&W. In the external market, the institutional constraints which cause differences in the earnings as a percentage of equity do not enter into consideration. The market price of securities of like characteristics determines the price, and in that market, the N&W must compete directly with other successful roads.

The Seaboard Coast Line.—The Seaboard Coast Line R.R. Co. (SCL) showed a decline relative to both industrial and utility earnings, which continued from early 1954 to the mid-1960's, before the railroad's performance improved to the point where it either held its own (against industrials) or improved (against utilities). Because nonrecurring expenses were recorded as operating rather than extraordinary expenses, the years 1967 and 1968 show up considerably worse than they actually were on an adjusted basis. It was in those years that the costs of the Seaboard Air Line-Atlantic Coast Line Railroad merger ran down apparent profits. The firm behavior in subsequent years, however, gives strong indication of the temporary and merger-related nature of these difficulties.

The general performance of the railroad, as measured by the ratio of its earnings to those of utilities, declined from 1954 through the mid-1960's relative to both industrials and utilities (see table 4). It began improving slightly relative to utilities and more or less held its own relative to industrials during the early 1970's. The late 1960's are difficult to evaluate because of the financial adjustments caused by the merger.

TABLE 4.—*Seaboard Coast Line*

Date	Price			Earnings per share	Issues & splits	Adj. earnings	Dividends	Dividends per share	No. of shares
	High	Low	Av.						
1973	$52 1/4	$21 7/8	$37.1	5.21		$26.05	$31,875,000	$1.10	14,551,087
1972	70 1/8	44 1/4	57.2	5.67		28.35	30,401,000	2.20	14,526,702
1971	63 3/4	37 3/8	50.6	4.44		22.20	26,839,000	2.20	12,413,163
1970	40 3/8	22 1/4	31.3	[1]3.19		15.95	19,922,000	2.20	9,508,529
1969	52 7/8	32 1/8	42.5	4.24		21.20	20,043,989	2.20	9,068,688
1968	54	40	47	1.40		7.00	19,177,767	2.20	8,717,516
1967	69 3/4	40 1/2	55.1	[2]3.13	Atlantic RR merger	15.65	18,023,693	2.00	8,716,247
1966	58	33 3/4	45.9	[2]4.38		21.90	19,553,173	1.80	8,709,113
1965	51 7/8	35	43.4	3.36		16.80	8,291,903	1.70	4,879,665
1964	57 3/8	42 1/2	49.9	3.29		16.45	7,784,026	1.60	4,873,205
1963	45 3/4	32 1/2	39.1	3.39		16.95	7,756,506	1.60	4,849,895
1962	33 1/8	21	27.1	3.21		16.05	7,747,020	1.60	4,842,718
1961	37 1/4	27	32.1	2.52		12.60	7,742,571	1.60	4,839,482
1960	38 5/8	29 1/8	33.9	3.10		15.5	9,673,528	2.00	4,837,252
1959	40 3/4	31 1/2	72.3	3.52		17.60	9,658,373	2.00	4,834,799
1958	39 3/4	21 1/8	30.4	3.11		15.55	9,631,666	2.00	4,825,899
1957	36	20	28	3.85		19.25	12,007,686	2.50	4,805,385
1956	44 3/4	35	39.9	4.20	2 for 1 split	21.00	11,936,728	2.50	4,797,610
1955	87 1/2	69 1/2	78.5	9.05		22.63	11,254,800	4.75	2,379,636
1954	80	42	61	8.51		21.28	8,942,854	3.80	2,365,057
1953	45 1/2	36 5/8	41.1	8.90	2 1/2 for 1 split	22.25	7,084,111	3.50	2,349,475

---

[1] Seaboard Industries exchanged share for share to secure all of railroad 99.4 percent by March 1970, 100 percent by May 1971.

[2] Includes Atlantic Coast Line earnings in 1966 restated to include both roads.

TABLE 4.—*Seaboard Coast Line*—Continued

Date	Total[2] Assets	Value of shareholder equity	Earnings ratios		Earnings	Earnings	Dividends
			Rail/Industrial	Rail/Utilities	Equity	Price	Earnings
1973	$2,441,312	$975,050	$1.002	$3.450	$7.78	$14.04	$0.42
1972	2,249,217	917,533	1.398	3.668	8.98	9.91	.39
1971	[1]2,193,045	863,710	1.262	3.092	6.38	8.78	.50
1970	1,325,950	680,778	1.042	2.315	4.46	10.19	.69
1969	1,246,092	763,228	1.209	3.063	5.04	9.98	.51
1968	1,211,339	727,735	[3].643	[3]1.694	2.71	4.81	1.57
1967	[2]1,184,200	[2]734,374	0.993	2.346	3.71	5.68	.64
1966	[2]1,230,004	[2]724,868	1.305	3.476	5.26	9.54	.41
1965	498,681	328,368	1.023	2.838	4.99	8.29	.51
1964	489,818	320,069	1.146	3.041	5.01	6.59	.49
1963	474,169	310,979	1.364	3.397	5.29	8.67	.47
1962	438,359	302,070	1.446	3.396	5.15	11.85	.50
1961	370,164	233,942	1.311	2.910	6.64	7.85	.63
1960	373,384	229,875	1.611	3.762	6.52	9.14	.65
1959	372,306	224,469	1.786	4.607	7.58	4.87	.57
1958	361,414	216,839	1.871	4.284	6.92	10.23	.64
1957	366,073	209,738	1.874	5.645	8.82	13.75	.65
1956	355,853	201,946	2.029	6.269	9.98	10.53	.60
1955	344,535	197,050	2.153	7.050	10.93	11.53	.52
1954	333,008	186,104	2.539	7.238	10.81	13.95	.45
1953	326,234	175,969	2.886	8.004	11.88	21.65	.39

[1] Acquired remaining interest in L&N.

[2] Includes Atlantic Coast Line.

[3] Adjusted to partly reflect ACL merger costs which reduced earnings in 1967 and 1968.

Similarly, the earnings to equity and earnings to price values were poor indicators during that period. The market appears to have discounted the poor earnings during the merger period, since the earnings as a percentage of price were 5.7 and 4.8 percent in 1967 and 1968, respectively. Values of 8 percent and above characterized most of the years preceeding and following 1967 and 1968. The earnings/equity values show the same decrease during those years. The pattern in the 1950's is similar to the Southern and D&RGW. However, in the 1960's, the return on equity remained relatively stagnant, and this is reflected in the lower earnings as a percentage of shareholder equity. The situation appears to have been corrected in the early 1970's by higher earnings which are generating returns on equity comparable of those of the N&W or the D&RGW. It appears that the railroad was not earning a market rate of return on internally generated funds during the 1960's. Whatever problems caused the low earnings during that period, the merger seems to have at least temporarily ended it.

The longrun warranted return on internally generated funds appears, particularly on the basis of the past 3 years experience, to be around the level for the N&W. The lower rates in the 1960's, coupled with the relative earnings data, combine to indicate that the return during that period was below the warranted rate. Expectations of increased profitability held up the price of the SCL to some extent in the early 1970's. Even with such changed expectations at work on the stock price, the earnings price ratio is close enough to that of the other railroads during that period to indicate that a 10-plus-percent rate would be needed to attract external capital. The decline from 1970 to 1972 is a reflection of the sharp increases in earnings during that period, and the 1972 and 1973 values indicate that the effect seems largely to have passed. The 1974 price range of 34 high and 19 low assures that the earnings price ratio will stay high. This railroad, more than the others hereinbefore discussed, has had some substandard years which are reflected in the historical record.

The Chessie System.—The Chessie System consists of the Chesapeake & Ohio Ry. Co. (C&O), the Baltimore & Ohio R.R. Co., the Western Maryland Ry., and various short-line railroads. The Chessie System was formed in 1973 as a holding company and to date the financial data does not appear to differ in general behavior from that of the C&O data. The C&O has not experienced a high growth rate, although it has not been stagnant. Over the past 10 years it has generated earnings generally proportional to industrials and to utilities, although there appears to have been some decline in 1971 and 1973 (see table 5).[4] Since the firm has consistently paid out over two-thirds of its earnings in the form of dividends, this represents a relatively good record. The system's earnings/equity record is consistent in pattern and level with the other railroads examined except for the years 1970 to 1973 when the values are consistently low, reflecting the relatively poor performance of that period. The stock prices have fallen to reflect performance, thus the values of earnings as a percentage of price have remained at 12 to 13 percent during the period except for the extraordinarily bad year of 1971. Although the evidence does not, on balance, support an 8- to 9-percent return as the historical average on internally generated funds which must be maintained, it is clear that unless the C&O earns such a return, there would be an incentive for the holding company to transfer carrier funds into nonrailroad investments.

---

[4] Data in table 5 depicts The Chessie System as reported in *Moody's Transportation Manual, 1974*, for the years 1967-1973 and C&O for 1953-1966.

TABLE 5.—*Chessie System*

Date	Price			Earnings per share	Issues & splits	Adj. earnings	Dividends	Dividends per share	No. of shares
	High	Low	Av.						
1973	$59 1/2	$40	$49.7	[1]$6.78	Feb. 26, 73	+4.54	$30,223,000	$3.60	8,621,142
1972	59 3/4	43 5/8	51.7	[1]6.49		+4.81	25,998,000	3.00	8,683,169
1971	70	41 1/2	55.8	[1]3.25		+2.85	26,049,000	3.00	8,683,171
1970	58 3/4	39 5/8	49.2	[1]6.09		+2.69	34,733,000	4.00	8,683,176
1969	75 1/4	49	62.1	6.05		+4.35	34,734,000	4.00	8,682,177
1968	75 3/4	60 1/4	68	[2]6.35		+5.09	34,774,000	4.00	8,683,232
1967	71 1/2	60 1/2	66	[2]6.02		+4.74	34,427,610	4.00	8,688,498
1966	86 1/4	60	73.1	[2]5.13			34,758,657	4.00	8,688,848
1965	78 7/8	65 1/8	72	[2]5.48			34,848,113	4.00	8,677,865
1964	80 3/8	68 1/2	74.4	4.72			35,807,617	4.00	8,917,965
1963	69 1/4	51 3/8	60.3	4.60			36,139,661	4.00	8,966,758
1962	60	44 1/2	52.3	4.30			32,826,056	4.00	8,221,632
1961	67 3/4	54	60.9	3.60			32,845,014	4.00	8,221,632
1960	69 3/4	54 5/8	62.2	5.15			32,748,367	4.00	8,202,907
1959	74 3/8	64 7/8	69.6	5.60			32,625,216	4.00	8,170,574
1958	69 1/8	47 3/4	58.4	6.36			32,385,354	4.00	8,118,967
1957	69 7/8	46 3/4	58.3	8.36			32,279,910	4.00	8,085,151
1956	69 1/4	53 3/4	61.5	8.28			28,945,714	3.625	8,019,463
1955	56 3/4	42 1/2	49.6	7.25			24,751,054	3.125	7,944,717
1954	46 1/8	33 1/8	39.7	5.01			23,576,069	3.00	7,861,938
1953	41 5/8	32 3/4	37.4	6.04			23,545,411	3.00	7,854,518

[1] Note extraordinary items resulted in changes to 1973 (7.71), 1972 (6.08), 1971 (d6.83), 1970 ($5.42).

[2] From report to ICC: Report to stockholders shows generally higher earnings 1969 (6.05), 1968 (6.35), 1967 (6.02), 1966 (7.61) 1965 (7.45).

+Earnings per share reported to ICC on C&O.

TABLE 5.—*Chessie System*—Continued

	Total assets	Value of shareholder equity	Earnings ratios		Earnings	Earnings	Dividends
			Rail/Industrial	Rail/Utilities	Equity	Price	Earnings
1973	[1]$2,611,320	$922,372	$0.261	$0.598	$6.34	$13.64	$0.53
1972	[1]2,602,722	881,747	.320	.839	6.39	12.55	.46
1971	[1]2,614,339	1,053,628	.184	.455	2.68	5.8	.92
1970	[1]2,717,841	1,139,021	.398	.884	4.64	12.38	.66
1969	[1]2,671,636	1,125,671	.345	.874	4.67	9.74	.66
1968	[1]2,528,613	1,079,245	.361	.952	5.11	9.34	.63
1967	[1]2,548,662	1,052,928	.381	.903	4.97	9.12	.66
1966	[1]1,278,445	612,811	.306	.814	7.27	7.02	.78
1965	[1]1,240,749	602,312	.333	.926	7.895	7.61	.73
1964	1,224,052	609,066	.328	.872	6.91	6.34	.85
1963	1,176,394	628,356	.370	.921	6.56	7.63	.87
1962	1,199,191	611,941	.387	.909	5.76	8.22	.93
1961	1,074,483	622,031	.374	.831	4.76	5.91	1.11
1960	1,065,922	625,667	.535	1.250	6.75	8.28	.78
1959	1,068,040	614,528	.569	1.466	7.45	8.05	.71
1958	1,060,967	596,390	.765	1.752	8.66	10.89	.63
1957	1,087,032	579,385	.514	2.452	11.67	14.34	.48
1956	1,040,055	534,426	.800	2.471	12.42	13.46	.44
1955	982,552	493,515	.689	2.259	11.67	14.62	.43
1954	923,543	458,368	.598	1.704	8.59	12.62	.60
1953	948,428	446,910	.783	2.173	10.62	16.15	.50

[1] Restated Chessie System values. The C&O-reported assets for 1967-73 are 1967-1,328,046, 1968-1,301,023, 1969-1,283,323, 1970-1,342,458, 1971-1,314,867, 1972-1,263,898.

Conclusion—The evidence available indicates that a return on internally generated funds of 8 to 9 percent, and on secondary issue funds of whatever the market demands, currently as high as 13 or 14 percent, but closer to 10 percent if the firm can choose its time of release to coincide with favorable conditions, are reasonable. Several caveats are in order. First, the return on book value of equity increases as a result of inflation with a lag. Similarly, as inflation tapers off, the return on book value of equity can be expected to fall but with a lag. During the period of low inflation (early and mid-1960's), the rate of return fell, consistent with lower market interest rates. Thus, one can expect some lag between the time that the rate of inflation declines and earnings as a percentage of equity declines. Second, a major reason that railroads need earn less on internally generated funds is that the dissolution of a railroad is costly. Reinvestment yields a high return relative to alternatives. If a holding company is brought into the picture, it may well transfer funds out of the railroad into other more profitable nonrailroad ventures. This effectively raises the cost of internally generated funds. If the holding company management feels that the long-run prospects are better in nonrailroad than railroad investment, no realistic return on internally generated funds can halt the process.

The 8- to 9-percent rate compares favorably with long-run market rates of return suggested by Fisher and Lorie[5] and thus has some external support. Such a return, however, is subject to the criticism that it fails to take shortrun considerations into account. To the extent that expectation of continued inflation persists, the adjustment occurs with a lag; however, if the current inflation is not brought under control, even a 9-percent rate—the upper bound of our predicted range—will most certainly be low in the future.

---

[5] L. Fisher and J. Lorie, "Rate of Return on Investments in Common Stocks: The Year by Year Record, 1926-1965", *Journal of Business*, April 1970, pp. 99-134.

APPENDIX M

Glossary of technical terms

Elasticity.—Measure of relative change in a given item in response to changes in another. For example, the elasticity of X relative to Y is the percentage change in X divided by the percentage change in Y with which the change in X is associated.

F statistic.—This statistic is a ratio of the mean square error about the regression estimates to the mean square error about the mean of the dependent variable. Its relative magnitude indicates the significance of the regression equation as a whole.

Ordinary least squares.—The standard or most common technique of regression analysis (see below). As formulated, it minimizes the sum of squared deviations between observed values and those calculated using the estimated equation.

R^2 or coefficient of determination or multiple determination.—A statistical measure of goodness of fit of a regression equation (see below) to observe data. It represents the proportion of total variance in the dependent variable explained by the independent variable(s).

Regression analysis.—A statistical procedure now commonly used in economic forecasting to quantify the historical relationships between key series of statistics.

In the most common application—single equation ordinary least squares analysis—a variable is chosen as the "dependent variable" to be explained or related to one or more "explanatory" or "independent variables." For example, materials and supplies expenses (M) may be chosen as the dependent variable to be related to ton-miles (T).

One then postulates an algebraic relationship between the two sets of variables—in this example, say the relationship is

$$M = a + bT.$$

Then a formula in which statistical series for M and T are entered is used to yield estimates for a and b which result in the closest (least squares) approximation to the actual relationship between the series. Postulating a curvilinear relationship between M and T may lead to a closer approximation still. The terms a and b in the example, when estimated by regression analysis, are referred to as *regression coefficients*.

Standard error.—Generally, a standard error is the root-mean-square of the deviations from the arithmetic mean. This is a special form of average deviation from the mean which disregards the sign of the deviation and gives each deviation a weight proportional to its magnitude. The standard error of estimates is a measure of the degree of dispersion of the data about the line of regression; it is indicative of the reliability of the regression equation in estimating the dependent variable. One may determine from the standard error of estimate the probability that the actual value of the dependent variable will be within specified limits from the regression line assuming a normal distribution about the regression line. The standard error of a regression coefficient is used to measure the "degree of significance" of a particular independent or explanatory variable in a regression equation. (See definition of t-value below.)

t-value.—A statistical indicator used to measure the probability that a particular estimate (*e.g.*, a mean of a series of numbers of some other normally distributed variable) could have been obtained by chance as a result of random variation. In this study t-values are obtained for regression coefficients (see above description) and are computed by dividing the standard error of the regression coefficient into the regression coefficient. Statistical tables are available to determine whether according to this t-value the regression coefficient is significantly different from zero, i.e., whether the independent variable is functionally related to the dependent variable. Certain conditions often present in economic statistics can bias this test.

Time trend element.—A variable entered in a regression equation to represent the progression of time. This is accomplished by arbitrarily assigning the variable values of 1, 2, 3, ..., with the number 1 representing the initial year (or other period) of observations. The effect of such a variable is to capture the impact of secular trends over time attributable to causes either not practicably quantifiable or unknown. For example, one may postulate a regression equation where ton miles (T) are to be explained by production (P) and time (t):

$$T = a + bP + ct$$

The data (observations) for ton-miles and production may span the period 1963-74, in which case t takes the value 1 for 1963, 2 for 1964, et cetera. The regression coefficient c, which may be negative, would presumably represent systematic and continual long term shifts away from rail transportation due to highway expansion and changes in consumption and distribution patterns.

APPENDIX N

Annual report data summary

Schedule (Key to 1974 annual report)	Federal Rail Administration file 1962-71	Data extracted from reports 1965-74	Data files annually produced by Commission				
			1971	1972	1973	1974	Other
200	X	------	X	X	X	X	------
211	------	------	X	X	X	X	------
211 D	------	------	X	X	X	X	------
211 E	------	------	X	X	X	X	------
211 F	------	------	X	X	X	X	------
211 N-2	------	------	X	X	X	X	------
211 N-1	------	------	X	X	X	X	------
300	X	------	X	X	X	X	------
305	X	------	X	X	X	X	------
310	X	------	X	X	X	X	------
309	------	------	------	------	------	X	------
320	X	------	X	X	X	X	------
322	X	------	X	X	X	X	------
324	X	------	X	X	X	X	------
326	X	------	X	X	X	X	------
328	X	------	X	X	X	X	------
330	X	------	X	X	X	X	------
350 A	------	------	X	X	X	X	------
350 B	------	------	X	X	X	X	------
350 C	------	X	------	X	------	------	------
376	------	------	X	X	X	X	------
377	------	------	X	X	X	X	------
378	------	------	X	X	X	X	------
412	------	------	X	X	X	X	------
417	X	X	X	X	X	X	------
421	------	------	X	X	X	X	------
510B	------	------	X	X	X	X	------
511	------	------	X	X	X	X	------
531	X	------	X	X	X	X	------
109	------	------	X	X	X	X	------
600	------	------	------	------	X	X	------
218	------	------	------	------	------	X	------
211 I	------	------	------	------	------	------	[1]X

---

[1] Only U.S. total available for years 1962 to 1974.

EX PARTE NO. 270[1]

INVESTIGATION OF RAILROAD FREIGHT RATE STRUCTURE

Decided September 30, 1976

Appearances as shown in prior reports.

REPORT OF THE COORDINATOR

HARDIN, *Commissioner:*

In a prior report, *Investigation of Railroad Freight Rate Structure,* 345 I.C.C. 1 (1973) (First Coordinator's Report), the Coordinator reviewed the status of this investigation, setting forth the manner in which he intended the investigation to proceed, and announced the institution of a series of subnumbered investigations as follows:

Ex Parte No. 270 (Sub-No. 3)
Investigation of Railroad Freight Rate Structure—Uneven Effects of General Increases on Individual Railroads.

Ex Parte No. 270 (Sub-No. 4)
Investigation of Railroad Freight Rate Structure—Coal

Ex Parte No. 270 (Sub-No. 5)
Investigation of Railroad Freight Rate Structure—Iron Ores

Ex Parte No. 270 (Sub-No. 6)
Investigation of Railroad Freight Rate Structure—Scrap Iron and Steel

Ex Parte No. 270 (Sub-No. 7)
Investigation of Railroad Freight Rate Structure—Lumber and Lumber Products

Subsequently, two additional subinvestigations were ordered:

Ex Parte No. 270 (Sub-No. 8)
Investigation of Railroad Freight Rate Structure—Paper and Paper Products

Ex Parte No. 270 (Sub-No. 9)
Investigation of Railroad Freight Rate Structure—Grain and Grain Products

---

[1] Also embraces Ex Parte No. 270 (Sub-No. 3), Investigation of Railroad Freight Rate Structure—Uneven Effects of General Increases on Individual Railroads.

In the report, the Coordinator also drew attention to certain other investigations separately instituted by the Commission which, in one way or another, concerned the railroad freight rate structure and the adequacy of service being provided by the railroads.

The passage of time, the progress made in this investigation, the decisions by the Commission, and other developments in the transportation sector, including the enactment of the Railroad Revitalization and Regulatory Reform Act of 1976 (4R Act), P.L. 94-210, make it desirable and appropriate to issue this, the Coordinator's final report, in the lead Ex Parte No. 270 investigation. The primary purposes of this report are to review the progress and status of the investigation and to suggest to the Commission the procedure to be followed with respect to the further phases of this investigation.

STATUS AND FUTURE COURSE OF THE INVESTIGATION

One of the purposes of the *First Coordinator's Report, supra,* was to give direction to this proceeding. As the Coordinator's function has been almost completed, it is now appropriate to review the status of the rate structure investigation. The following proceedings have been concluded:

Ex Parte No. 270 (Sub-No. 1A)
Investigation of Railroad Freight Rate Structure—Export-Import Rates and Charges—Pacific Coast, entire Commission decision reported at 345 I.C.C. 423.

Ex Parte No. 270 (Sub-No. 1B)
Investigation of Railroad Freight Rate Structure—Export-Import Rates and Charges—Great Lakes, entire Commission decision reported at 345 I.C.C. 1364.

Ex Parte No. 270 (Sub-No. 4)
Investigation of Railroad Freight Rate Structure—Coal, Coordinator decision reported at 345 I.C.C. 71 and entire Commission decision reported at 345 I.C.C. 493.

In the following proceedings reports of the Coordinator have been served and the proceedings are pending before the entire Commission. As consistently stated throughout this investigation, the Coordinator will not participate in the entire Commission decisions with respect to those proceedings:

Ex Parte No. 270 (Sub-No. 2)
Investigation of Railroad Freight Service, 345 I.C.C. 1223

Ex Parte No. 270 (Sub-No. 5)
Investigation of Railroad Freight Rate Structure—Iron Ores, 345 I.C.C. 548

Ex Parte No. 270 (Sub-No. 6)
Investigation of Railroad Freight Rate Structure—Scrap Iron and Steel, 345 I.C.C. 867

Reports of the Coordinator, in the following proceedings, will be served in the relatively near future:

Ex Parte No. 270 (Sub-No. 7)
Investigation of Railroad Freight Rate Structure—Lumber and Lumber Products

Ex Parte No. 270 (Sub-No. 8)
Investigation of Railroad Freight Rate Structure—Paper and Paper Products

For reasons to be subsequently detailed in this report, the Coordinator recommends: (a) that the lead Ex Parte No. 270 proceeding be concerned with studies of those commodities contained in the appendixes to the order herein served April 9, 1974 (sometimes known as the "SPC commodities groups" and reproduced herein for convenience as appendixes A, B, and C), insofar as those commodities have not been studied in subnumbered investigations as well as with studies of intercommodity rate structure relationships, (b) that Ex Parte No. 270 (Sub-No. 3) be discontinued and (c) that the remaining Ex Parte No. 270 subnumbered investigation, Sub-No. 9, be procedurally handled in a manner other than by the issuance of a Coordinator's report to be followed by an entire Commission decision. Specifically, it is the Coordinator's recommendation: (1) that the investigation in (a) above should proceed as informal studies to be conducted by the Commission's Bureau of Economics, (2) that Ex Parte No. 270 (Sub-No. 3), Investigation of Railroad Freight Rate Structure—Uneven Effects of General Increases on Individual Railroads, be discontinued, and (3) that Ex Parte No. 270 (Sub-No. 9), Investigation of Railroad Freight Rate Structure—Grain and Grain Products, continue to its conclusion under the general supervision of the Commission. Thus, the need for a Commissioner Coordinator is terminated, although the ongoing informal studies should remain under the Commission's general supervision.

GENERAL OBSERVATIONS RELATING TO THE SUBNUMBERED COMMODITY INVESTIGATIONS

In order to place in proper perspective the further procedural handling of this investigation, it is appropriate to indicate in broad terms certain observations to be drawn from the concluded rate structure investigations.

1. The railroad rate structures have developed over the years largely in response to market forces. Although many seemingly divergent rate structures appear among the various commodities and regions of the country, each has a logic of its own, born of real and divergent economic forces. The impact of growing competition and the historic influence of the Commission have tended to bring the various rate structures more in line with cost levels and market conditions. As cost methodologies are refined and cost relationships become better known, the carriers and the Commission can continue to move in this direction with greater confidence. Indeed, the refinements in costing techniques developed in these proceedings indicate that there may be greater uniformity of cost/rate relationship among and within commodity movements than would appear from the "burden" studies. The flexibility of the characteristics bona fide reactions of carriers and shippers to changing market circumstances under regulatory surveillance has yielded overall benefits to carriers, shippers, and communities. Such flexibility should not be sacrificed in the name of formula consistency or abstract theory. That Congress has accepted this thesis is evident from its rejection of deregulation in favor of the reforms provided in the 4R Act.

Some inconsistencies and distortions have grown up under the present system of regulation, whether from custom, ignorance, neglect, inertia, or for some other reason. Such problems, while relatively minor in relation to the structure as a whole, may be quite important to the parties involved. Many of these, when brought to light, can be solved through informal negotiation or through regular Commission procedures. However, it may be expensive or otherwise difficult for the parties involved to resolve the problems through formal proceedings. Another means, which should be further developed to encourage the consideration of such situations informally between the parties, lies in handling by the Commission's Section of Rates and Informal Cases of the Bureau of Traffic.

2. Within the present framework of regulation, the carriers and shippers have demonstrated an ability to meet new and changing situations with new technologies and rate structure variations. The record repeatedly indicates that regulation, as it is actually applied, has not interfered with innovation. Moreover, as the interdependence of diverse social and economic forces is becoming more recognized, the historic role of the Commission as a "third

party"—protector of the overall public interest—may be facilitated, as it has in this proceeding, by the Special Projects Staff and in the future by the new Office of Rail Public Counsel. The more flexible ratemaking provided by the 4R Act should enhance railroad managements' opportunities to structure rates in accordance with market realities.

3. General rate increases have not been self-defeating in recent years, based on the evidence thus far reviewed in this investigation. Rather, they appear to be a necessary means for the carriers to recoup some of the general cost increases in time of severe inflation. As inflation may be said to be coming a way of life, general rate increases may in turn become increasingly "institutionalized" as appropriate responses to rising costs. In this vein, the investigation in Ex Parte No. 290, *Procedures Governing Rail General Increase Proc.*, 351 I.C.C. 544, is an appropriate outgrowth and extension of this proceeding.

A good part of the apparent effectiveness of general rate increases, however, has been the recognition by carriers and the Commission of the need for selectivity with respect to competitive or other unique situations and the use of holddowns to prevent unacceptable, absolute dollar distortions in rate relationships. While the record contains much evidence of value for Commission and carrier consideration in this respect, more information needs to be developed (by Commission staff, carriers, and others) on the responsiveness of traffic to changes in rate levels and relationships. Further, while the relationship of rate increases to terminal versus line-haul costs is a problem, the record has not developed sufficiently accurate quantitative formulas by which to apportion such rate increases. Further research needs to be done in this area.

Efforts should be concentrated, through existing proceedings, on developing information more accurately and quickly to respond to the carriers' need for general rate increases. A substantial record has been made in these proceedings to enable the Commission more realistically to assess the need for various holddowns and/or special treatment for various commodities.

4. There has been shown a need for basic research and reevaluation in the area of costing methodologies. Such work has been undertaken with Commission initiative and will continue as mandated by the 4R Act. The Coordinator encourages the carriers and the transportation community at large to participate fully in this undertaking. This proceeding has encouraged and yielded useful innovations within the basic framework of Rail Form A costing

techniques. Such applications as separate costing of trainload and multiple-carload movements, consideration of the utilization of specialized equipment by the traffic in question, treatment of way train expenses independently of distance, and similar innovations have produced some very different pictures of the reality of cost/rate relationships from those previously observed.

5. If there is a villain or a savior with respect to the "railroad problem," the rate structure is not it. Substantial basic changes in the rate structures are not called for, nor could they solve the basic problems of the railroads and shippers with respect to revenue and service needs. While there is room for improvement in the rate structures, as has been and will be more specifically demonstrated in the subproceedings, a preponderance of evidence indicates that potentials for changes in the level and structures of rates are largely circumscribed by economic realities. To a large extent, the rate structures are evolving products shaped by real world constraints. Moreover, changes in technology generally, means of doing business, world events such as the petroleum shortage, public expenditures for other modes of transportation, EPA and other governmental policies, and the level of economic activity in general have a far greater impact on rail traffic, revenue profit, and service levels than could any possible anomalies in the rate structures.

Railroad service and profitability, as well as the overall allocation of resources in the economy, can be improved through increased knowledge and innovation in costing and ratemaking by the carriers and the Commission. The record shows that the Commission has been receptive to innovation by carriers and shippers and it continues to be so.

6. A critical characteristic of these proceedings is the striking interdependence which the issues of the subnumbered investigations have with each other and with other ongoing proceedings of this Commission. General revenue level and rate of return, profitability and operating conditions, specific rate/cost relationships, the applicability and effects of general rate increases, and the ability and incentive to provide adequate rail service are all inexorably tied together. The Commission, the carriers, the shippers, and others seeking changes in the transportation system must continually recognize this fact, and assess proposals and recommendations accordingly.

Before discussion of the proposed further handling of the lead docket, the reasons for the recommendation to discontinue the Ex Parte No. 270 (Sub-No. 3) proceeding will be set forth.

EX PARTE NO. 270 (SUB-NO. 3)

INVESTIGATION OF RAILROAD FREIGHT RATE STRUCTURE—UNEVEN EFFECTS OF GENERAL INCREASES ON INDIVIDUAL RAILROADS

The Coordinator has concluded that no useful purpose will be served at this time by continuing a separate subnumbered proceeding on the uneven effects of general rate increases on individual railroads. Accordingly, the order herein discontinues Ex Parte No. 270 (Sub-No. 3), effective 30 days from date of service unless good cause is shown to the contrary. By so doing, the Coordinator is not discounting the importance of the issues involved in the uneven effects of general increases, but on reflection and in light of developments since the institution of that subnumbered proceeding, he believes that the issues should be approached differently.

Clarification of the meaning of "uneven effects" is necessary as background to the reasons for closing Ex Parte No. 270 (Sub-No. 3). The term obviously has several meanings to the parties filing representations. Some see the term as covering economic impacts arising from general rate increases on: (1) individual railroads or groups of railroads, (2) specific commodities or similar commodities, (3) geographic regions, (4) specific classes of traffic (*e.g.*, short haul vs. long haul), and (5) particular shippers or groups of shippers. The economic impacts on shippers logically would be the results of (a) the shippers' commodities, or (b) the geographic region in which the shipper is located, or (c) the serving railroad(s), or (d) the operational class of traffic tendered, *e.g.*, long haul or short haul. In general, the term as variously used in the statements by railroads and shippers reflects traditional contentions based on varying self-interests.

If the definition of "uneven effects" is confined to "uneven effects of general increases on individual railroads," the meaning becomes clearer. To be more specific, uneven effects on individual railroads resulting from general rate increases are comprised of the relative disparities in revenue gains for one railroad in comparison with another railroad or other railroads. The disparity for the railroad being compared to other railroad(s) can be favorable (higher), or adverse (lower), and can be determined by a comparison of the relative gain in revenue and profitability directly resulting from the application of the general increase for one railroad with the gains for another railroad or group of railroads.

The Special Project Staff (SPS)[2] believes that there are three basic issues to be considered: (1) determination of those costs and fixed charges which vary significantly between railroads and thereby result in uneven effects from general rate increases, (2) determination of the revenue generating abilities of individual railroads that vary as between railroads and result in uneven effects, and (3) determination of the remedies or alternative policies (revenue pooling, divisions, and escrow funds) which should be pursued to eliminate or alleviate uneven effects on individual railroads. The SPS believes that it is "too early in this proceeding" to consider issue (3) because the basic strong-weak railroad problem is too little understood. Finally, the SPS states that the instant proceeding should not be permitted "to run too far ahead" of the other proceedings in Ex Parte No. 270.

The issues in Ex Parte No. 270 (Sub-No. 3) should be considered in context with the Commission's overall responsibilities in general rate increase proceedings and the rules and procedures prescribed by the Commission in relation thereto because of the considerable degree of interdependency. In Ex Parte No. 290, the Commission set forth the evidentiary requirements in rail general revenue proceedings. The prescribed data and information to be submitted by the railroads concern, *inter alia,* data as to financial and revenue need as reported at the individual carrier level, and which can be used to address the issue of how individual roads, or groups of roads, generally fare in comparison with other roads. Thus, one method of measuring the uneven effects of a proposed increase is to examine changes in the financial posture of the railroad(s), with and without the increase, in terms of rate of return on net investment. Moreover, Ex Parte No. 290 requires data concerning the uneven effects of the increase, including commodities, localities, types of traffic, as well as, where necessary, information on individual carriers, together with suggestions as to the avoidance of possible detrimental effects. (351 I.C.C. 544 at 651.)

In Ex Parte No. 271, the question of uneven effects of general rate increases, as applied to district aggregations of railroads, is an issue since it is related to the design and application of alternative revenue standards necessary to determine capital requirements. Past general rate proceedings have treated the railroads in districts or groups for ratemaking purposes, while capital requirements must be financed by individual railroads. Recognizing this, a number of parties to Ex Parte No. 271 have contended that rates of return on net investment, or alternative measures of capital requirements, have validity only as they relate to the unique financial posture and needs of individual railroads. In the Ex Parte No. 290 (Sub-No. 1) decision, the Commission promulgated specific rules requiring submission of data and information related to the last approved general increase. The individual railroads must explain any significant difference in total estimated revenues, if the last authorized increase had been fully applied, and total actual revenues based on rates actually applied during the study period. The differences will be expressed in terms of changes in traffic levels, average length of haul, traffic mix, rate changes, and other relevant factors. From these data, the Commission will be able to: (1) isolate those increases in revenues derived solely as a result of the increase in rates, and (2) compare the relative increases in revenues between individual railroads or groups of railroads. In short, the possibility exists that uneven effects will be made apparent as a result of the new evidentiary requirements.

---

[2] The successor group to the Special Projects Counsel (SPC) and his staff.

A part of the 4R Act is directed toward some of the issues involved in the uneven effects of general rate increases. Most noteworthy, in this respect, are the railroad rehabilitation and improvement financing provisions of Title V and the implementation of the Final System Plan under Title VI. These measures are intended to assist in fulfilling the congressional purposes of upgrading railroad physical facilities and restoring financial stability of the system as a whole. Achievement of these purposes would tend to vitiate the "weak and strong railroad" syndrome, particularly so in the case of the bankrupt properties serving the Northeast. The 4R Act also directs the Secretary of Transportation to promote mergers and consolidations to the end of restructuring railroads into a more efficient system, and requires more expeditious handling of mergers by the Commission. Success in this program also implies a mitigation of the weak railroad problem.

The 4R Act revisions in the regulation of rates will also impact on uneven effects issues. Railroads have been granted increased opportunities for establishing more competitive rates; for example, provision is made for separate rates for distinct services, rates based on seasonal, regional, or peak period demand, as well as for changes in individual rates aggregating not more than 7 percent in each of the next 2 years, provided that the rates are neither predatory nor discriminatory under sections 2, 3, or 4 of the Interstate Commerce Act. With these new opportunities, railroad managements' responsibility to establish just and reasonable rates in the first instance has become even more sharply defined and may lead to less reliance on general rate increases and more on individual rate adjustments as a means of generating adequate revenues.

The Commission in accordance with section 201 of the 4R Act, in Ex Parte No. 322, *Expeditious Handling of Divisions of Revenue Cases*, 353 I.C.C. 349, has adopted regulations designed to expedite division of revenue proceedings. Accordingly, the possibility exists that by utilization of these new procedures marginal railroads may be able to improve their financial portion.

For all of these reasons and the further observation that participation in Ex Parte No. 270 (Sub-No. 3) has been quite limited, the Coordinator believes that the public interest would be better served now by discontinuing this subproceeding. The changed circumstances and the limited record, without extensive further representations respecting these changes, makes it highly improbable that the issues would be resolved in any meaningful way. Rather, it is nearly certain that "uneven effects" can be more directly addressed as the various provisions of the 4R Act are implemented, together with consideration accorded in general increases which may be filed under Ex Parte No. 290 when those regulations become effective.

INTERCOMMODITY RATE RELATIONSHIPS

The subnumbered commodity investigations, relating to the major commodities transported by rail, were instituted to facilitate the development of a comprehensive record on which to base conclusions on the rate structures of these individual commodities and the effect general increases have had on such structures. It was, of course, recognized that this approach would not suffice to deal directly with intercommodity relationships.

The Coordinator's reports issued or to be issued in these commodity subnumbered investigations have disclosed certain common characteristics that hold the promise of simplifying a study of intercommodity rate structure relationships. In effect, the rationale for a substantial portion of the entire rate structure is discernible from the in-depth review conducted in the completed subnumbered proceedings. The first general observation is that general freight rate increases, in the context of this proceeding, have not proved to be self-defeating. Rather, general increases have enabled the railroads to recoup rising expenses and have served this purpose with little evidence of resulting traffic loss. A second preliminary conclusion about freight rate structures is that regulation has produced a reasonable orderly relationship in the rate structures. Whether the rate structure was developed voluntarily by shippers and carriers or instituted through a Commission proceeding, there is no instance of violent disparities or distortions in establishing and maintaining rates. Furthermore, the history shows that the Commission has been flexible in allowing shippers and carriers to develop rate structures to meet their needs and to make adjustments where modification was appropriate.

A third preliminary conclusion is that the general increases have caused some distortions in the rate patterns. However, these distortions generally have not caused any serious disruptions of shipper, carrier, or market relationships. For example, the most common distortion in the rate structure is the widening of the differentials between related rate groups. These differentials first occur in the basic measurement of the respective uneven rates and are widened in the final disposition of fractions in the application of the ex parte increases. This is a serious problem if the resulting rate distortion inhibits movements of a commodity from one producing location to the benefit of another, or hampers its distribution to particular localities. Nevertheless, other factors, such as the commodity base available for hauling, changes in the economic climate, competitive pressures, and technological change, seem more important in determining the final movements to different areas.

The opportunity for submission of evidence on intercommodity relationships has been circumscribed by first having to address the rate structure relationships within major commodity subgroupings. However, logic seems to suggest that if general increases have not been self-defeating to any great extent, and distortions and disparities, especially as indicated by revenue/cost relationships, are confined to isolated instances, it is not likely that unjust discriminations between commodities will exist to any crucial degree. Nevertheless, the order herein issued will enable the parties to the proceeding to supplement the record with evidence and argument respecting this issue. On the whole, the Coordinator is convinced that no compelling reason exists to institute new subinvestigations of individual commodity grouping. This is not to say, however, that the need for further studies of rate structures and the impact of general increases on them should not continue. The order herein issued and the recommendations that follow should provide adequate opportunity and means for such important endeavors to proceed.

The Coordinator has been impressed with the ability of the Commission's staff, the Special Projects Staff, and parties to the investigation in developing and analyzing the railroad rate structure in these proceedings even in the face of limited, and in some instances inadequate, traffic data and cost estimating systems. Their generally cooperative attitude, initiative, and resourcefulness demonstrate that it is well within the capabilities of those concerned with improving the railroad pricing structure to pool their respective talents in a way to assure that any changes in rates or ratemaking policy are based on firm information and analysis. It is no longer necessary, however, that this work continue as a formalized investigation under the jurisdiction of a Commissioner Coordinator. If those rich resources of talent just mentioned are properly utilized, the informal study will permit an intelligent evaluation of the rate structure. Should maladjustments become apparent, they can be resolved either formally or informally through the usual Commission procedures.

Accordingly, it is recommended that the study of those commodities, as listed in the "SPC groups" and not heretofore investigated, and the intercommodity relationships aspect of the investigation, proceed informally as studies conducted under the auspices of the Commission's Bureau of Economics. It is further recommended that the formal Ex Parte No. 270 proceeding be terminated 30 days from date of service of this report.

EX PARTE NO. 270 (SUB-NO. 9)

INVESTIGATION OF RAILROAD FREIGHT RATE STRUCTURE— GRAIN AND GRAIN PRODUCTS

The record in Ex Parte No. 270 (Sub-No. 9) is in the process of being developed under guidelines issued by the Coordinator. Since the completion of this subnumbered investigation will extend considerably beyond the time the Coordinator anticipates issuance of his reports in the other subnumbered investigation cases and in Ex Parte No. 271, no good purpose would be served by continuing the requirement that a Coordinator's report be issued before a final decision is entered by the entire Commission. However, the parties are assured that the Ex Parte No. 270 (Sub-No. 9) investigation will continue and the issuance of a final report by the Commission is anticipated. The final report in the Ex Parte No. 270 (Sub-No. 9) proceeding will, in all likelihood, be preceded by oral hearings and either an Administrative Law Judge's initial decision, or an interim report by an appropriate decisional body.

CONCLUSION

To maintain the momentum generated by this series of investigations toward developing a rate structure which satisfies as nearly as possible the respective needs of the shippers and carriers, the Coordinator, as already noted, recommends generally that the studies move into this new phase. Groundwork for this phase has already been laid in the Commission to enable the Commission's staff to undertake more intensive rate structure studies. The specific actions in progress include:

Request for return of the rail carload waybill sample to the Commission for processing, including a comprehensive research program to improve its usefulness and reliability.

Revision of the Uniform System of Accounts for Class I railroads to reflect cost functions more accurately and reduce the necessity of statistical apportionment of expenses.

Concurrent with the accounting system revisions, development of cost estimating procedures to provide a more precise measurement of the relationships between costs of services and the rates and charges imposed therefor.

Development of a computerized data bank comprising information on traffic, costs, service, equipment utilization, finances, productivity, and other essential determinants along the lines recommended by the Coordinator in Ex Parte No. 270 (Sub-No. 4).

Establishment of an Office of Rail Public Counsel to assist the Commission in the development of the public interest record in proceedings before the Commission, as enacted by section 304 of the 4R Act. The Commission had already provided for an Office of Public Counsel for the same purpose and is seeking legislation to broaden the current functions to cover all modes of transportation.

Reorganization of the Bureau of Economics to assure greater consideration of economic factors in reaching Commission decisions.

The development of sophisticated methods of forecasting carriers' revenue needs.

As the Coordinator has publicly stated on many occasions, the review of the railroad rate structure is a highly important undertaking and should be continued indefinitely. This investigation has been oriented primarily to the concerns expressed in terms of the effects of general rate increases on the rate structures. The commodity studies have so far revealed that, in fact, problems do exist as a result of the general increases but they are for the most part not of the gravity feared initially. The Coordinator is also satisfied that railroad ratemaking, as practiced in the marketplace over the years under Commission supervision, has evolved rate structures, however intricate and complex, that are generally responsive to public and private needs. So finding, the Coordinator is nevertheless convinced that opportunities for improvement exist and should be explored with the cooperation of shippers, carriers, and other interests. Accordingly, the Coordinator proposes the establishment of a continuing informal study under the guidance of the Commission, whereby shippers, carriers, and other interests could join together to share ideas and information, coordinate research, including the holding of conferences, seminars, or other meetings to establish priorities of effort. While the concerns regarding the impacts of general increases have been somewhat alleviated, they continue to deserve continued scrutiny in such studies, as well as within the context of the Commission's consideration of applications for general increase. It is inevitable that as a result of such studies, contentious problems will be identified which cannot be resolved informally and would perforce result in appropriate proceedings before the Commission. Nothing in this course of action is intended to diminish the rights of any interest under the law or rules of the Commission. Rather, the wealth of competent data and analysis resulting from the studies would tend to assure prompt, equitable resolutions.

The Coordinator, therefore, recommends that the Commission as a matter of policy direct continuous informal studies of the railroad rate structures and allocate the needed manpower and other resources necessary to support such an effort. While the participation of a great variety of skills—economists, attorneys, cost experts, rail, and industry rate and transportation specialists, for example—is called for, the dominant activity centers on pricing—the realm of economics. For this reason, the Coordinator recommends that the Commission instruct the Director, Bureau of Economics, to develop a program, including organizational, operational, and administrative relationships, to move these studies forward.

Finally, the Coordinator will submit a series of recommendations in his remaining reports to the Commission which he believes will facilitate improvements in the railroad rate structure. The Coordinator hopes that parties will fully avail themselves of the opportunity to express their views in respect to these matters when filing exceptions to the Coordinator's reports yet to be issued.

APPENDIX A

Commodity groups (numerical list)

Commodity group no.	*Description*
1	Cotton
2	Wheat
3	Corn and Sorghum Grains
4	Barley
5	Grain, All Other
6	Soybeans
7	Rice
8	Potatoes, Other Than Sweet
9	Sugar Beets
10	Citrus Fruits
11	Apples
12	Deciduous Fruits
13	Fresh Vegetables
14	Melons
15	Iron Ore
16	Non-Ferrous Concentrates
17	Calcined or Activated Bauxite Ores
18	Anthracite Coal
19	Prepared Bituminous Coal for Metallurgical or Coking Purposes
20	Prepared Bituminous Coal for Fuel or Steam Purposes
21	Lignite, Prepared or Raw
22	Fluxing Limestone & Dolomite
23	Construction Aggregates
24	Industrial Sand
25	Clays, Dry, Other Than Fire Clay
26	Feldspar
27	Potash Fertilizers
28	Phosphate Rock
29	Fresh Meats and Packinghouse Products
30	Canned and Preserved Fruits and Vegetables
31	Other Foodstuffs, Canned, Preserved or Prepared
32	Frozen Fruits and Vegetables
33	Wheat Flour Milling Products
34	Dry Corn Milling Products
35	Other Grain Mill Products
36	Wet Corn Milling Products
37	Cereal Preparations (Cooked)
38	Sugar, Refined, Cane or Beet
39	Malt Liquors
40	Wines and Brandy
41	Alcoholic Liquors
42	Commercial Fats and Oils
43	Seed, Nut or Vegetable Cake or Meal

Commodity groups (numerical list)—Continued

Commodity group no.	*Description*
44	Cigars, Cigarettes, and Manufactured Tobacco
45	Textile Products
46	Pulpwood Logs
47	Pulpwood Chips
48	Lumber
49	Treated Wood Products
50	Wood Posts, Poles or Piling
51	Millwork and Other Lumber Products
52	Plywood or Veneer
53	Hardwood Dimension Stock and Flooring
54	Wood Particle Board
55	Furniture
56	Woodpulp and Other Pulps
57	Newsprint Paper
58	Ground Wood Paper
59	Printing Paper
60	Wrapping Paper and Paper Bags
61	Pulpboard, Other Than Corrugated
62	Pulpboard, Corrugated
63	Sanitary Paper Products
64	Paperboard Boxes or Containers
65	Food Containers and Fibre Cans, Drums or Tubes
66	Building Paper and Building Board
67	Industrial Inorganic Chemicals
68	Barium or Calcium Compounds
69	Sodium Alkalies
70	Soda Ash
71	Industrial Gases
72	Industrial Organic Chemicals
73	Sulphuric Acid
74	Anhydrous Ammonia
75	Superphosphate
76	Agricultural Chemicals, including Fertilizers
77	Plastic Materials
78	Rubber, Natural and Synthetic
79	Detergents and Other Cleaning Preparations
80	Salt, Rock and Common
81	Carbon Blacks
82	Petroleum Refining Products
83	Petroleum, Lubricating Oils and Greases
84	Asphalt Pitches or Tars
85	Liquified Gases, Coal or Petroleum
86	Construction Materials, Asphalt or Asbestos
87	Petroleum Coke
88	Coke Produced from Coal
89	Tires and Tubes, Rubber
90	Plastic Products

Commodity groups (numerical list)—Continued

Commodity group no.	*Description*
91	Glass Containers
92	Hydraulic Cement
93	Brick or Blocks, Clay or Shale
94	Clay Refractories
95	Lime
96	Gypsum Building Materials
97	Mineral Wool
98	Pig Iron
99	Semi-finished Steel
100	Manufactured Iron or Steel
101	Iron or Steel Pipe, Tubes or Fittings
102	Railway Track Material
103	Ferroalloys
104	Primary Copper Products
105	Primary Zinc Products
106	Primary Aluminum Products
107	Brass, Bronze or Copper Basic Shapes
108	Aluminum Basic Shapes
109	Metal Containers
110	Farm Machinery
111	Heavy Machinery
112	Major Household Appliances
113	Household Radios or Television Sets
114	Motor Passenger Cars, Assembled
115	Motor Vehicles, Assembled (Other Than Passenger Cars)
116	Motor Vehicle Parts
117	Locomotive or Railway Car Parts
118	Iron or Steel Scrap
119	Non-Ferrous Metal Scrap
120	Textile Waste or Scrap
121	Paper Waste or Scrap
122	Chemical or Petroleum Waste
123	Shipping Containers or Devices, Returned Empty
124	Freight Forwarder Traffic
125	Shipper Association Traffic
126	Miscellaneous Mixed Shipments

APPENDIX B

Index of Commodity Groups (Alphabetical List)

Aggregates (see Construction **aggregates**)	
Agricultural chemicals, including fertilizers	76
Alcoholic liquors	41
Aluminum, basic shapes	108
Aluminum primary products	106
Anhydrous ammonia	74
Anthracite coal	18
Apples	11
Asbestos construction materials	86
Asphalt construction materials	86
Asphalt pitches or tars	84
Automobiles, assembled	114
Automobiles, parts	116
Barium or calcium compounds	68
Barley	4
Bauxite ore	17
Bituminous coal, metallurgical	19
Bituminous coal, steam	20
Brass, bronze or copper basic shapes	107
Brick or blocks, clay or shale	93
Building materials, gypsum	96
Building paper and building board	66
Cake, seed, nut or vegetable	43
Calcined or activated bauxite ores	17
Calcium compounds	68
Canned and preserved fruits and vegetables	30
Canned, preserved, prepared foodstuffs, other	31
Carbon blacks	81
Cement, hydraulic	92
Cereal preparations (cooked)	37
Chemical or petroleum waste	122
Chemicals (see Industrial and individual chemicals)	
Cigars, cigarettes and manufactured tobacco	44
Citrus fruits	10
Clay or shale brick or blocks	93
Clay refractories	94
Clays	25, 26
Cleaning preparations and detergents	79
Coal, Anthracite	18
Coal, Bituminous, metallurgical	19
Coal, Bituminous, steam	20
Coke, petroleum	87
Coke produced from coal	88
Commercial fats and oils	42
Concentrates, copper and zinc	16
Construction aggregates	23
Construction materials, asphalt or asbestos	86
Containers, empty return	123
Containers, fibre	65
Containers, glass	91
Containers, metal	109
Copper, basic shapes	107
Copper concentrates	16
Copper, primary products	104
Corn	3

Index of Commodity Groups (Alphabetical List)—Continued

Corn milling products, dry 34
Corn milling products, wet 36
Cotton 1
Deciduous fruits 12
Detergents and cleaning preparations 79
Dolomite 22
Farm machinery 110
Fats and oils, commercial 42
Feldspar 26
Ferroalloys 103
Fertilizers (see Agricultural chemicals, and individual chemicals and fertilizers).
Fibre cans, drums, tubes 65
Fire clay, dry 25
Flooring 53
Fluxing limestone and dolomite 22
Food containers and fibrecans, drums, tubes 124
Fresh meats and packinghouse products 29
Fresh vegetables 13
Frozen fruits and vegetables 32
Fruits (see Apples, canned and preserved fruits, citrus fruits, deciduous fruits, frozen fruits, melons)
Furniture 55
Gases (see Industrial gases, liquified gases, and individual chemicals)
Glass containers 91
Grain, all other (see also Barley, Corn and sorghum, Rice, Soybeans, Wheat). 5
Ground wood paper 58
Gypsum building materials 96
Heavy machinery 111
Household appliances, major 112
Household radios and television sets 113
Hydraulic cement 92
Industrial gases 71
Industrial inorganic chemicals 67
Industrial organic chemicals 72
Industrial sand 24
Iron, manufactured 100
Iron pipe, tubes or fittings 101
Iron, scrap 118
Iron ore 15
Iron or steel pipes, tubes or fittings 101
Iron or steel scrap 118
Lignite 21
Lime 95
Limestone, fluxing, and dolomite 22
Liquified gases, coal or petroleum 85
Liquors, (see Alcoholic liquors, Malt liquors, wines and brandy).
Locomotive or railway car parts 117
Lubricating oils and gases 83

Index of Commodity Groups (Alphabetical List)—Continued

Lumber	48	Paper (see Building paper, Ground wood paper, Newsprint paper, Printing paper, Pulpboard, Sanitary paper products, Wrapping paper and paper bags)	
Machinery, farm	110	Paperboard boxes or containers	64
Machinery, heavy	111	Paper waste or scrap	121
Malt liquors	39	Petroleum coke	87
Manufactured iron or steel	100	Petroleum lubricating oils and greases.	83
Meal, seed, nut or vegetable	43	Petroleum refining products	82
Meat, fresh	29	Petroleum waste	122
Melons	14	Phosphate rock	25
Metal containers	109	Pig iron	98
Milling products, corn, dry	34	Pitches or tars, asphalt	84
Milling products, corn, wet	36	Plastic materials	90
Milling products, other	35	Plywood or veneer	52
Milling products, wheat	33	Potash fertilizers	27
Millwork and other lumber products	51	Potatoes, other than sweet	8
Mineral wool	97	Prepared bituminous coal, metallurgical	10
Miscellaneous mixed shipments	126	Prepared bituminous coal, steam	20
Motor passenger cars, assembled	144	Primary aluminum products	106
Motor vehicles, assembled (other than passenger cars)	115	Primary copper products	104
Motor vehicle parts	116	Primary zinc products	105
Newsprint paper	57	Printing paper	59
Non-ferrous metal scrap	119	Pulpboard, corrugated	62
Oils, commercial	42	Pulpboard, other than corrugated	61
Ores (see Bauxite, Iron)		Pulpwood logs (see also woodpulp)	47
Other foodstuffs, canned, preserved, prepared	31		
Packinghouse products	29		

Index of Commodity Groups (Alphabetical List)—Continued

Pulpwood chips	48
Radios, household	113
Railway car parts	117
Railway track material	102
Rice	7
Rubber, natural and synthetic	78
Rubber tires and tubes	89
Salt, rock and common	80
Sand (see industrial sand)	
Sanitary paper products	63
Scrap, iron or steel	118
Scrap, non-ferrous	119
Scrap, paper	121
Scrap, textile	120
Seed, nut or vegetable cake or meal	43
Semifinished steel	99
Shipper association traffic	125
Shipping containers or devices, returned empty	123
Soda ash	70
Sodium alkalies	69
Sorghum grains	3
Soybeans	6
Steel, manufactured	100
Steel, pipe, tubes or fittings	101
Steel, scrap	118
Steel, semifinished steel	99
Sugar beets	9
Sugar, refined, cane or beet	38
Sulphuric acid	73
Superphosphate	75
Television sets, household	113
Textile products	45
Textile waste or scrap	120
Tires and tubes, rubber	89
Tobaccos	44
Treated wood products	49
Trucks, motor, assembled	115
Trucks, parts	116
Vegetables (see canned and preserved fruits and vegetables, fresh vegetables, frozen fruits and vegetables).	
Veneer woods	52
Wheat	2
Wheat flour milling products	33
Wines and brandy	40
Woods (see Hardwood dimension stock, lumber, millwork, plywood, pulpboard chips, pulpwood logs, treated wood products, wood particle board, wood posts).	
Wood particle board	54
Wood posts, poles or piling	50
Woodpulp and other pulps	56
Wrapping paper and paper bags	60
Zinc, basic shapes	107
Zinc concentrates	16
Zinc, primary products	105

APPENDIX C

STCC code conversion table (STCC lists)

Commodity group no.		1966	1969	1972
1	Cotton	01 121	01 121	01 121
2	Wheat	01 137	01 137	01 137
3	Corn and Sorghum Grains	01 132	01 132	01 132
		01 136	01 136	01 136
4	Barley	01 131	01 131	01 131
5	Grain, All Other	01 133	01 133	01 133
		01 135	01 135	01 135
		01 139	01 139	01 139
6	Soybeans	01 144	01 144	01 144
7	Rice	01 134	01 134	01 134
		20 441	20 441	20 441
		20 443	20 443	20 443
8	Potatoes, Other Than Sweet	01 195	01 195	01 195
9	Sugar Beets	01 197	01 197	01 197
10	Citrus Fruits	01 211	01 211	01 211
		01 212	01 212	01 212
		01 214	01 214	01 214
		01 215	01 215	01 215
		01 219	01 219	01 219
		01 213 10		
11	Apples	01 221 10	01 221 10	01 221 10
12	Deciduous Fruits	01 222	01 222	01 222
		01 223	01 223	01 223
		01 224	01 224	01 224
		01 225	01 225	01 225
		01 226	01 226	01 226
		01 227	01 227	01 227
		01 228	01 228	01 228
		01 229	01 229	01 229
13	Fresh Vegetables	01 311	01 311	01 311
		01 312	01 312	01 312
		01 313	01 313	01 313
		01 315	01 315	01 315

STCC code conversion table (STCC lists)—Continued

Commodity group no.		1966	1969	1972
13	Fresh Vegetables—Continued			
		01 317	01 317	01 317
		01 318	01 318	01 318
		01 319	01 319	01 319
		01 314 10		
		01 314 15		
		01 316 10		
		01 316 15		
		01 331	01 331	01 331
		01 332	01 332	01 332
		01 333	01 333	01 333
		01 334	01 334	01 334
		01 335	01 335	01 335
		01 336	01 336	01 336
		01 337	01 337	01 337
		01 339	01 339	01 339
		01 391	01 391	01 391
		01 393	01 393	01 393
		01 394	01 394	01 394
		01 395	01 395	01 395
		01 396	01 396	01 396
		01 397	01 397	01 397
		01 399	01 399	01 399
14	Melons			
		01 392	01 392	01 392
		01 398	01 398	01 398
15	Iron Ore			
		10 111	10 111	10 111
		10 112	10 112	10 112
		10 113	10 113	10 113
		33 121 55		
16	Non-Ferrous Concentrates			
		10 212	10 212	10 212
		10 312	10 312	10 312
		10 322	10 322	10 322
17	Calcined or Activated Bauxite Ores			
		10 513	10 513	10 513
18	Anthracite Coal			
		11 112	11 112	11 112
19	Prepared Bituminous Coal For Metallurgical or Coking Purposes			
		11 212 90	11 212 90	11 212 10
20	Prepared Bituminous Coal For Fuel or Steam Purposes			
		11 212 90	11 212 90	11 212 90
21	Lignite, Prepared or Raw			
		11 221	11 221	11 221
		11 222		
22	Fluxing Limestone & Dolomite			
		14 212	14 212	14 212
		14 213	14 213	14 213
		14 215	14 215	14 215

STCC code conversion table (STCC lists)—Continued

Commodity group no.		1966	1969	1972
23	Construction Aggregates			
		09 131 20	09 131 20	09 131 20
		09 131 25	09 131 25	09 131 25
		14 219 50	14 219 50	14 219 50
		40 271 45		
		14 219 65	14 219 65	14 219 65
		14 219 72	14 219 72	14 219 72
		14 219 90	14 219 90	14 219 90
		14 411	14 411	14 411
		14 412	14 412	14 412
		32 952 78	32 952 78	32 952 78
		32 959 29	32 952 82	32 952 82
		32 952 15	32 952 15	32 952 15
		32 952 91	32 952 91	32 952 91
		33 112	33 112	33 112
24	Industrial Sand			
		14 413	14 413	14 413
25	Clays. Dry. Other Than Fire Clay			
		14 511	14 511	14 511
		14 514	14 514	14 514
		14 519 90	14 519 90	14 519 90
		32 952 25	32 952 25	32 952 25
		32 952 32	32 952 32	32 952 32
		32 952 86	32 952 86	32 952 86
		32 952 87	32 952 87	32 952 87
26	Feldspar			
		14 515	14 515	14 515
		32 955	32 955	32 955
27	Potash Fertilizers			
		14 713 25	14 713 25	14 713 25
		14 713 26	14 713 26	14 713 26
		20 619 25	20 619 25	20 619 25
		28 125 34	28 125 34	28 125 34
		28 125 36	28 125 36	28 125 36
		28 125 52	28 125 52	28 125 52
			28 125 67	28 125 67
28	Phosphate Rock			
		14 714 10	14 714 10	14 714 10
		32 959 61	32 959 61	32 959 61
29	Fresh Meats and Packinghouse Products			
		20 111	20 111	20 111
		20 119	20 119	20 119
		20 113 15		
		20 113 10		
		20 121	20 121	20 121
		20 129	20 129	20 129
		20 123 10		
		20 132	20 132	20 132
		20 133	20 133	20 133

STCC code conversion table (STCC lists)—Continued

Commodity group no.	1966	1969	1972
29	Fresh Meats and Packinghouse Products—Continued		
	20 139 25	20 139 25	
	20 139 26	20 139 26	
	20 999 30		
30	Canned & Preserved Fruits & Vegetables		
	20 331	20 331	20 331
	20 332	20 332	20 332
	20 333	20 333	20 333
	20 334 15	20 334 15	20 334 15
	20 334 25	20 334 25	20 334 25
	20 334 35	20 334 35	20 334 35
	20 334 40	20 334 40	20 334 40
	20 334 41	20 334 41	20 334 41
		20 334 43	20 334 43
	20 334 55	20 334 55	20 334 55
	20 334 60	20 334 60	20 334 60
	20 334 65	20 334 65	20 334 65
	20 334 70	20 334 70	20 334 70
	20 335	20 335	20 335
31	Other Foodstuffs, Canned, Preserved or Prepared		
	20 134	20 134	20 134
	20 155	20 155	20 171
	20 233 25	20 233 25	20 233 25
	20 311	20 311	20 311
	20 312		
	20 315		
	20 361 10		
	20 314 21	20 314 21	20 314 21
	20 321	20 321	20 321
	Except 20 321 10	*Except* 20 321 10	
	20 322	20 322	20 322
	20 323	20 323	20 323
	20 329	20 329	20 329
	20 336	20 336	20 336
	20 338	20 338	20 338
	20 339 90	20 339 90	20 339 90
	20 339 91	20 339 91	20 339 91
	20 343 10	20 343 10	20 343 10
	20 352	20 352	20 352
	20 354 15	20 354 15	20 354 15
	20 354 20	20 354 20	20 354 20
	20 353 10	20 359 15	20 359 15
	20 359 20	20 359 20	20 359 20
	20 359 30	20 359 30	20 359 30
	20 359 45	20 359 45	20 359 45
	20 353 90	20 359 90	20 359 90
	20 391	20 391	20 391
	Except 20 391 10		
	---do--- 20 391 15		

STCC code conversion table (STCC lists)—Continued

Commodity group no.	1966		1969	1972
31	Other Foodstuffs, Canned, Preserved or Prepared—Continued			
	20 423		20 423	20 423
	20 261 12			
	20 334 75		20 861 30	20 861 30
	20 861 40		20 861 40	20 861 40
			20 871 28	20 871 28
	20 871 30		20 871 30	20 871 30
	20 872 91		20 871 90	20 871 90
	20 991 10		20 991 10	20 991 10
	20 991 15		20 991 15	20 991 15
			20-999 33	20 999 33
32	Frozen Fruits & Vegetables			
	20 371		20 371	20 371
	20 372		20 372	20 372
	20 373		20 373	20 373
			20 379	20 379
	20 374 39	*Except*	20 379 90	
	20 374 35			
33	Wheat Flour Milling Products			
	20 411		20 411	20 411
	20 412		20 412	20 412
	20 421 48		20 421 48	
	20 418 46		20 418 46	20 418 46
	20 418 72		20 418 72	20 418 72
	20 419 31		20 419 31	20 419 31
	20 419 39		20 419 39	20 419 39
	20 419 60		20 419 60	20 419 60
	20 419 72		20 419 72	20 419 72
	20 419 74		20 419 74	20 419 74
	20 419 83		20 419 83	20 419 83
	20 419 84		20 419 84	20 419 84
34	Dry Corn Milling Products			
	20 413		20 413	20 413
	20 419 20		20 419 20	20 419 20
	20 419 22		20 419 22	20 419 22
	20 419 27		20 419 27	20 419 27
	20 419 40		20 419 40	20 419 40
	20 419 52		20 419 52	20 419 52
	20 419 53		20 419 53	20 419 53
	20 419 56		20 419 56	20 419 56
	20 419 79		20 419 79	20 419 79
	20 419 93		20 419 93	20 419 93
35	Other grain mill products			
	20 414		20 414	20 414
	20 415		20 415	20 415
	20 416		20 416	20 416
				20 418 22
				20 419 24
	20 419 26		20 419 26	20 419 26

STCC code conversion table (STCC lists)—Continued

Commodity group No.	1966	1969	1972
35	Other grain mill products—Continued		
	20 419 28	20 419 28	20 419 28
	20 419 30	20 419 30	20 419 30
	20 419 38	20 419 38	20 419 38
	20 419 58	20 419 58	20 419 58
	20 419 66	20 419 66	20 419 66
	20 419 68	20 419 68	20 419 68
		20 419 77	20 419 77
	20 419 90	20 419 90	20 419 90
	20 419 91	20 419 91	20 419 91
	20 419 92	20 419 92	20 419 92
	20 419 94	20 419 94	20 419 94
	20 421	20 421	20 421
	28 996 64		
	Except 20 421 48	*Except* 20 421 48	
	01 991 15		
	01 991 16		
	39 491 10		
	39 491 40		
	01 199 66	01 199 66	
	20 432	20 432	20 432
	Except 20 432 15		
	20 451	20 451	20 451
	20 452	20 452	20 452
36	Wet corn milling products		
	20 461	20 461	20 461
	20 462	20 462	20 462
	20 463	20 463	20 463
	20 464	20 464	20 464
	20 469 10	20 469 10	20 469 10
	20 469 20	20 469 20	20 469 20
	20 469 25	20 469 25	20 469 25
	20 469 35	20 469 35	20 469 35
	20 469 40	20 469 40	20 469 40
	20 469 45	20 469 45	20 469 45
37	Cereal preparations (cooked)		
	20 431	20 431	20 431
		Except 20 431 62	
	Except 20 431 70		
	20 999 32		
38	Sugar, refined, cane or beet		
	20 621	20 621	20 621
	20 622	20 622	20 622
	Except 20 622 90	*Except* 20 622 90	
	20 629	20 629	20 629
39	Malt liquors		
	20 821	20 821	20 821
40	Wines and brandy		
	20 841	20 841	20 841
41	Alcoholic liquors		
	20 851	20 851	20 851
42	Commercial fats and oils		
	20 131	20 131	20 131
	20 138 10	20 139 53	20 139 53
	20 139 55	20 139 55	20 139 55
	20 143	20 143	20 143
	20 145		
		20 465	20 465
	20 465	20 911	20 911

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969	1972
42	Commercial fats and oils—Continued				
		20 911		20 914 55	20 914 55
		20 914 55		20 914 56	20 914 56
		20 921		20 921	29 921
		20 923 35		20 923 35	20 923 35
				20 923 36	20 923 36
		20 931		20 931	20 931
		20 933		20 933	20 933
	Except	20 933 45			
	---do---	20 933 55			
	---do---	20 933 58	*Except*	20 933 58	
		20 939 44		20 939 44	20 939 44
		20 939 82		20 939 57	20 939 57
				20 939 90	20 939 90
		20 961 18		20 961 18	20 961 18
		20 961 20		20 961 20	20 961 20
		20 961 25		20 961 25	20 961 25
		28 994		28 994	28 994
	Except	28 994 35			
	---do---	28 994 42	*Except*	28 994 42	
	---do---	28 994 55			
		28 999 46		28 999 46	
43	Seed, nut or vegetable cake or meal				
		20 914 35		20 914 35	20 914 35
		20 914 40		20 914 41	20 914 41
		20 914 41		20 914 42	20 914 42
				20 914 43	20 914 43
		20 914 50		20 914 50	20 914 50
		20 923 14		20 923 14	20 923 14
		20 923 15		20 923 15	20 923 15
		20 923 27		20 923 27	20 923 27
		20 923 55		20 923 55	20 923 55
		20 939 13		20 939 13	20 939 13
		20 939 14		20 939 14	20 939 14
		20 939 34		29 939 34	20 939 34
		20 939 38		20 939 38	20 939 38
		20 939 39		20 939 39	20 939 39
		20 939 50		20 939 50	20 939 50
44	Cigars, cigarettes, and manufactured tobacco				
		21 111		21 111	21 111
		39 995 45		39 995 45	
		21 211		21 211	21 211
		21 311		21 311	21 311
		21 312		21 312	21 312
		21 313		21 313	21 313
45	Textile products				
		22 111		22 111	22 111
		22 112		22 112	22 112
				22 113	22 113
		22 119		22 119	22 119
	Except	22 119 27			
		22 211		22 211	22 211
		26 499 08		26 499 08	

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969	1972
45	Textile products—Continued				
		22 213		22 213	22 213
		22 221		22 221	22 221
		22 311		22 311	22 311
		22 313		22 313	22 313
		22 411		22 411	22 411
		22 414			
	Except	22 411 50	*Except*	22 411 50	
		22 931 30			
		22 981 85		22 981 85	
		22 511		22 511	22 511
		22 811		22 811	22 811
		22 813		22 813	22 813
		22 819		22 819	22 819
		22 841		22 841	22 841
		22 921		22 921	22 921
		22 951		22 951	22 951
				26 499 87	
				30 719 40	
		22 961		22 961	22 961
		22 999		22 999	22 999
		20 914 15			
	Except	22 999 25	*Except*	22 999 25	
		22 993 15			
	Except	22 999 45			
	---do---	22 999 52	*Except*	22 999 52	
46	Pulpwood logs				
		24 114		24 114	24 114
47	Pulpwood chips				
		24 115 15		24 115 15	24 115 15
48	Lumber				
		24 211		24 211	24 211
		24 213			
		24 299 22			
	Except	24 211 64			
	---do---	24 211 65			
	---do---	24 211 68			
		24 119 58			
		24 291		24 291	24 291
49	Treated wood products				
		24 112		24 112	24 112
		24 118		24 118	24 118
		24 212		24 212	24 212
	Except	24 212 20			
		24 912		24 912	24 912
		24 919		24 919	24 919
		24 214 70		24 214 70	24 999 96
		24 214 72		24 214 72	24 999 97
		37 994 82		37 994 82	24 999 98
		29 511 65		29 511 65	29 511 65

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969	1972
50	Wood posts, poles or piling				
		24 116		24 116	24 116
		24 911		24 911	24 911
51	Millwork and other lumber products				
		24 219		24 219	24 219
		24 292		24 292	24 292
		24 415 19			
		24 415 16			
		24 415 22			
		24 415 71			
		24 415 67			
		24 311		24 311	24 311
		24 312		24 312	24 312
		24 313		24 313	24 313
		24 314		24 314	24 314
		24 316		24 316	24 316
		24 319		24 319	24 319
		24 321 80			
		24 951		24 951	24 951
52	Plywood or veneer				
		24 321		24 321	24 321
		24 331 15		24 331 15	
	Except	24 321 55			
	---do---	24 321 80			
	---do---	24 321 82			
	---do---	24 321 85			
53	Hardwood dimension stock and flooring				
		24 214		24 214	24 214
			Except	24 214 10	
			---do---	24 214 11	
			---do---	24 214 12	
		25 161 22			
		25 161 85			
		25 171 35			
	Except	24 214 16	*Except*	24 214 16	
	---do---	24 214 17	---do---	24 214 17	
		25 199 22			
		24 299 54			
	Except	24 214 70	*Except*	24 214 70	
	---do---	24 214 72	---do---	24 214 72	
		25 121 70			
		24 299 14			
		24 971 13		24 971 13	
		24 971 14		24 971 14	
		24 215		24 215	24 215
54	Wood particle board				
		24 993		24 993	24 996
55	Furniture				
		25 111		25 111	25 111

STCC code conversion table (STCC lists)—Continued

Commodity group No.	1966		1969		1972
55	Furniture—Continued				
		25 112			
	Except	25 111 44			
	---do---	25 111 48			
	---do---	25 111 55	*Except*	25 111 55	
	---do---	25 111 56	---do---	25 111 56	
	---do---	25 111 57	---do---	25 111 57	
	---do---	25 111 62			
	---do---	25 111 64			
		25 121		25 121	25 121
	Except	25 121 61			
	---do---	25 121 67			
	---do---	25 121 70			
		25 131		25 131	25 131
		25 132			
	Except	25 131 40			
	---do---	25 131 46	*Except*	25 131 46	
	---do---	25 131 55			
		25 141		25 141	25 141
		25 151		25 151	25 151
		25 152			
	Except	25 152 35			
		25 153		25 153	25 153
		25 154			
		25 161		25 161	25 161
	Except	25 161 22			
	---do---	25 161 31		24 214 12	
	---do---	25 161 70		24 214 10	
	---do---	25 161 73		24 214 11	
	---do---	25 161 76			
	---do---	25 161 77			
	---do---	25 161 79			
	---do---	25 161 85			
		25 173		25 173	25 173
		25 179		25 179	25 179
				25 174 27	
		25 172 15			
		25 172 25			
		25 172 20			
		25 172 21			
		25 172 10			
		25 181		25 181	25 181
		25 199		25 199	25 199
	Except	25 199 11	*Except*	25 199 11	
	---do---	25 199 12			
	---do---	25 199 22			
		34 998 62		34 998 62	
			Except	25 199 78	
		24 214 16		24 214 16	

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969	1972
55	Furniture—Continued				
		24 214 17		24 214 17	
		25 311		25 311	25 311
	Except	25 311 85			
		25 312		25 312	25 312
		25 313			
		25 314		25 314	25 314
	Except	25 313 15			
		25 315			
		25 319		25 319	25 319
		25 411		25 411	25 411
		25 412			
		25 413			
		25 415			
		25 419			
		25 421		25 421	25 421
	Except	25 421 74	*Except*	25 421 74	
	---do---	25 421 75	---do---	25 421 75	
		25 422			
		25 423			
		25 424			
		25 426			
		25 429			
		25 999		25 999	25 999
	Except	25 999 10			
		25 992			
		26 499 46		26 499 46	
				30 719 44	
				32 299 85	
		34 999 33		34 999 33	
56	Woodpulp and other pulps	26 111		26 111	26 111
		26 112 40		26 112 40	
57	Newsprint paper	26 211		26 211	26 211
58	Ground wood paper	26 212		26 212	26 212
	Except	26 212 10			
59	Printing paper	26 215		26 213	26 213
	Except	26 215 30			
		26 212 10			
		39 551 20			
		26 419 23			
		26 419 24			
		26 216 10			
		26 419 18			

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969	1972
59	Printing paper—Continued				
		26 217 10			
		26 419 28			
				27 419 69	
		26 419 26			
		26 216 40	*Except*	26 213 90	
60	Wrapping paper and paper bags				
		26 216		26 214	26 214
	Except	26 216 10			
	---do---	26 216 15			
	---do---	26 216 40			
	---do---.	26 415 10			
		26 415 25			
		26 415 30			
		26 492 25			
		26 492 60			
		26 492 30			
			Except	26 214 64	
		26 415 35			
		26 431		26 431	26 431
		26 439			
	Except	26 439 40			
	---do---	26 439 55			
	---do---	26 439 75			
		26 499 22			
			Except	26 431 26	
				30 719 06	
				30 719 07	
				30 719 08	
61	Pulpboard, other than corrugated				
		26 311 16		26 311 16	26 311 16
		26 311 21		26 311 21	26 311 21
62	Pulpboard, corrugated				
		26 311 15		26 311 15	26 311 15
		26 311 20		26 311 20	26 311 20
		26 311 25		26 311 25	26 311 25
63	Sanitary paper products				
		26 471		26 471	26 471
		26 472		26 472	26 472
64	Paperboard boxes or containers				
		26 511		26 511	26 511
	Except	26 511 46			
	---do---	26 511 73	*Except*	26 511 73	
			---do---	26 511 75	
65	Food containers and fibre cans, drums or tubes				
		26 542		26 542	26 542
				26 511 75	
		26 543		26 543	26 543
		26 546			
		26 545		26 545	26 545

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966	1969	1972
65	Food containers and fibre cans, drums or tubes—Continued			
		26 547	26 547	26 547
		26 549	26 549	26 549
	Except	26 549 15	*Except* 26 549 15	
		26 551	26 551	26 551
66	Building paper and building board			
		26 611	26 611	26 611
		26 612	26 612	26 612
		26 613	26 613	26 613
		26 614	26 614	26 614
		32 999 80		
		32 999 83		
		26 619	26 619	26 619
		32 961 23	32 961 23	32 961 23
67	Industrial inorganic chemicals			
		28 121	28 121	28 121
	Except	28 121 35		
		28 123 11	28 123 11	28 123 11
		28 123 12	28 123 12	28 123 12
		28 123 16	28 123 16	28 123 16
		28 123 18	28 123 18	28 123 18
		28 123 19	28 123 19	28 123 19
		28 123 20	28 123 20	28 123 20
		28 123 21	28 123 21	28 123 21
		21 123 27	28 123 27	28 123 27
		28 123 28	28 123 28	28 123 28
		28 123 30	28 123 30	28 123 30
		28 123 31	28 123 31	28 123 31
		28 123 33	28 123 33	28 123 33
		28 123 34	28 123 34	28 123 34
		28 123 35	28 123 35	28 123 35
		28 123 36	28 123 36	28 123 36
		28 123 39	28 123 39	28 123 39
		28 123 40	28 123 40	28 123 40
		28 123 41	28 123 41	28 123 41
		28 123 42	28 123 42	28 123 42
		28 123 44	28 123 44	28 123 44
		28 123 45	28 123 45	28 123 45
		28 123 47	28 123 47	28 123 47
		28 123 49	28 123 49	28 123 49
		28 123 53	28 123 53	28 123 53
		28 123 55	28 123 55	28 123 55
		28 123 56	28 123 56	28 123 56
		28 123 57	28 123 57	28 123 57
		28 123 58	28 123 58	28 123 58
		28 123 59	28 123 59	28 123 59
		28 123 60	28 123 60	28 123 60
		28 123 61	28 123 61	28 123 61
		28 123 62	28 123 62	28 123 62

STCC code conversion table (STCC lists)—Continued

Commodity group no.	1966	1969	1972
67	Industrial inorganic chemicals—Continued		
	28 123 63	28 123 63	28 123 63
		28 123 64	28 123 64
	28 123 75	28 123 75	28 123 75
	28 123 78	28 123 78	28 123 78
	28 123 79	28 123 79	28 123 79
		28 123 82	28 123 82
	28 123 60	28 123 83	28 123 83
	28 124	28 124	28 124
	Except 28 124 15		
	28 125 48	28 125 04	28 125 04
	28 125 14	28 125 14	28 125 14
	28 125 16	28 125 16	28 125 16
	28 125 18	28 125 18	28 125 18
	28 125 20	28 125 20	28 125 20
	28 125 24	28 125 24	28 125 24
	28 125 26	28 125 26	28 125 26
	28 125 28	28 125 28	28 125 28
	28 125 30	28 125 30	28 125 30
	28 125 32	28 125 32	28 125 32
	28 125 38	28 125 38	28 125 38
	28 125 42	28 125 42	28 125 42
	28 125 44	28 125 44	28 125 44
	28 125 46	28 125 46	28 125 46
		28 125 47	28 125 47
	28 125 50	28 125 50	28 125 50
	28 125 54	28 125 54	28 125 54
	28 125 64	28 125 64	28 125 64
	28 129	28 129	28 129
	28 161	28 161	28 161
	28 162	28 162	28 162
	28 163	28 163	28 163
	28 164		
	28 166		
	28 167		
	28 168		
	28 169	28 169	28 169
	28 126 21		
	28 126 60	28 126 60	
		Except 28 169 28	
	28 191 13	28 191 13	28 191 13
	28 191 16	28 191 16	28 191 16
	28 191 19	28 191 19	28 191 19
	28 191 22	28 191 22	28 191 22
	28 191 25	28 191 25	28 191 25
	28 191 28	28 191 28	28 191 28
	28 191 40	28 191 40	28 191 40
	28 191 43	28 191 43	28 191 43
	28 191 52	28 191 52	28 191 52

STCC code conversion table (STCC lists)—Continued

Commodity group no.		1966		1969	1972
67	Industrial inorganic chemicals—Continued				
		28 191 61		28 191 61	28 191 61
		28 191 64		28 191 64	28 191 64
		28 191 67		28 191 67	28 191 67
		28 191 70		28 191 70	28 191 70
		28 191 73		28 191 73	28 191 73
		28 191 81		28 191 81	28 191 81
		28 191 83		28 191 83	28 191 83
		28 192		28 192	28 192
		28 194		28 194	28 194
		28 195		28 195	28 195
		28 196		28 196	28 196
		28 123 10			
		28 123 13			
		28 123 85		28 123 85	
68	Barium or calcium compounds	28 126		28 126	28 126
	Except	28 126 10	*Except*	28 126 10	
	---do---	28 126 21			
	---do---	28 126 24			
	---do---	28 126 34	*Except*	28 126 34	
	---do---	28 126 36	---do---	28 126 36	
	---do---	28 126 37	---do---	28 126 37	
	---do---	28 126 47	---do---	28 126 47	
	---do---	28 126 60	---do---	28 126 60	
69	Sodium alkalies	28 122		28 122	28 122
		28 123 23			
70	Soda ash	28 123 22		28 123 22	28 123 22
71	Industrial gases			28 128	28 128
		28 121 35			
		28 132		28 132	28 132
		28 133		28 133	28 133
		28 139		28 139	28 139
	Except	28 139 18			
	---do---	28 139 24			
	---do---	28 139 48			
	---do---	28 139 62	*Except*	28 139 62	
		28 181 55			
72	Industrial organic chemicals	28 141		28 141	28 141
		28 142			
		28 143			
		28 144			
		28 145			
		28 149			

STCC code conversion table (STCC lists)—Continued

Commodity group no.		1966		1969		1972
72	**Industrial organic chemicals—Continued**					
	Except	28 149 25				
		29 919 18		29 919 18		
		29 919 70				
		28 151		28 151		28 151
		28 411 20		28 411 20		
	Except	28 151 55	*Except*	28 151 55		
		28 512 75				
		28 156		28 156		28 156
		28 158		28 158		28 158
		28 181		28 181		28 181
			Except	28 181 06	*Except*	28 181 06
		28 211 62		28 211 62		
		28 514 15				
	Except	28 181 55				
				28 182		28 182
		28 211 81				
		28 183		28 183		28 183
		30 719 36		30 719 36		
		30 613 10		30 613 10		
		28 184		28 184		28 184
		41 211 35				
	Except	28 184 50				
		20 933 44				
		29 199 57				
		20 145 40				
		20 942 35				
		28 185		28 185		28 185
		28 186		28 186		28 186
		28 123 66				
		28 123 15				
		28 123 29				
		28 123 69				
		28 123 32				
		28 123 70				
		28 123 71				
		28 126 24				
		28 125 10				
		28 125 22				
		28 514 10		28 514 20		
		28 123 46		28 123 46		
		28 123 48		28 123 48		
		28 123 72		28 123 72		
		28 125 58		28 125 58		
		28 126 34		28 126 34		
		28 126 36		28 126 36		
		28 126 37		28 126 37		
	Except	*28 186 54*	*Except*	28 186 54		
	---do---	28 186 74				

STCC code conversion table (STCC lists)—Continued

Commodity group no.		1966	1969	1972
72	Industrial organic chemicals—Continued			
		28 187		
		28 189	28 189	28 189
		28 311 15	28 311 15	
		28 311 18	28 311 18	
		28 311 14	28 311 14	
		28 311 17	28 311 17	
		28 123 68	28 123 68	
		28 512 40	28 211 20	
		28 139 48		
		28 211 38	28 211 38	
	Except	28 189 75		
73	Sulphuric acid	28 193	28 193	28 193
74	Anhydrous ammonia	28 198	28 198	28 198
	Except	28 198 10		
		28 139 18		
75	Superphosphate	28 191 46	28 191 46	28 191 46
				28 191 47
				28 191 48
		28 191 49	28 191 49	28 191 49
		28 199 10	28 199 10	28 199 10
		28 199 15	28 712 40	28 712 40
		28 711 28	28 712 50	28 712 50
		28 711 30	28 712 51	28 712 51
76	Agricultural chemicals, including fertilizers	28 191 10	28 181 06	28 181 06
			28 191 10	28 191 10
				28 191 11
		28 191 31	28 191 31	28 191 31
		28 191 34	28 191 34	28 191 34
		28 191 37	28 191 37	28 191 37
		28 191 55	28 191 55	28 191 55
		28 191 58	28 191 58	28 191 58
		28 199 14	28 199 14	28 199 14
		28 191 76	28 712 44	28 712 44
		28 711	28 713	28 713
			28 714	28 714
			28 719	28 719
			20 144 08	
		20 144 25	20 144 25	
		20 144 35	20 144 35	
		20 144 65	20 144 65	
		28 799	28 799	28 799
			28 422 31	
		28 422 35	28 422 35	

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969	1972
76	Agriculture chemicals, including fertilizers—Continued				
	Except	28 799 52			
		28 186 54		28 186 54	
		28 186 74			
		28 123 24			
		39 998 41			
		40 291 27		40 291 27	40 291 27
77	Plastic materials				
		28 211		28 211	28 211
	Exept	28 211 10	*Except*	28 211 10	
			---do---	28 211 20	
	Except	28 211 38	---do---	28 211 38	
	---do---	28 211 50			
	---do---	28 211 52			
	---do---	28 211 54			
	---do---	28 211 58			
	---do---	28 211 62	*Except*	28 211 62	
	---do---	28 211 81			
78	Rubber, natural and synthetic				
		08 423 20		08 423 20	08 423 20
		08 423 25		08 423 25	08 423 25
		28 212		28 212	28 212
	Except	28 212 15	*Except*	28 212 15	
79	Detergents and other cleaning preparations				
		28 411		28 411	28 411
	Except	24 411 10			
	---do---	28 411 20	*Except*	28 411 20	
		28 419		28 419	28 419
		32 914 25			
		28 422		28 422	28 422
	Except	28 422 15	*Except*	28 422 15	
	---do---	28 422 20	---do---	28 422 20	
	---do---	28 422 25	---do---	28 422 25	
			---do---	28 422 31	
	---do---	28 422 35	---do---	28 422 35	
		28 799 52			
		32 914 20		32 914 20	
80	Salt, rock and common				
		14 715		14 715	14 715
		20 997 20		20 997 20	20 997 20
		28 991		28 991	28 991
81	Carbon blacks				
		28 996		28 996	28 996
	Except	28 996 47			
	---do---	28 996 48			
	---do---	28 996 52			
	---do---	28 996 55			
			Except	28 996 57	

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969	1972
81	Carbon blacks —Continued				
	Except	28 996 61			
	---do---	28 996 64			
				39 999 90	
82	Petroleum refining products				
		29 111		29 111	29 111
		29 112		29 112	29 112
		29 113		29 113	29 113
		29 117		29 117	29 117
		29 119		29 119	29 119
	Except	29 119 25			
	---do---	29 119 57			
		28 189 75		28 189 75	
83	Petroleum—lubricating oils and greases				
		29 114		29 114	29 114
		22 994 16			
			Except	29 114 60	
		29 115		29 115	29 115
84	Asphalt pitches or tars				
		29 116		29 116	29 116
		28 149 25			
85	Liquified gases, coal or petroleum				
		29 121		29 121	29 121
86	Construction materials.asphalt or asbestos				
		29 521		29 521	29 521
		29 522		29 522	29 522
				29 523	29 523
		29 529		29 529	20 529
		32 922		32 922	32 922
		32 932		32 932	32 924
			Except	32 932 13	
			---do---	32 932 17	
	Except	32 932 35	---do---	32 932 35	
	---do---	32 932 40	---do---	32 932 40	
	---do---	32 932 45	---do---	32 932 45	
				32 932 50	
	---do---	32 932 76			
	---do---	32 932 79	---do---	32 932 79	
		32 929 64		32 929 64	
87	Petroleum coke				
				29 913	29 913
		33 113 36			
		28 996 47		29 919 20	
88	Coke produced from coal				
		33 113		33 113	29 914
	Except	33 113 36			

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969	1972
89	Tires and tubes, rubber				
		30 111		30 111	30 111
		30 114		30 114	30 114
		30 119		30 119	30 119
90	Plastic products				
		30 712		30 712	30 712
	Except	30 712 35			
		30 713		30 713	30 713
	Except	30 713 10	*Except*	30 713 10	
		30 719 68		30 719 68	
		30 719 69		30 719 69	
	Except	30 713 65			
		30 716		30 716	30 716
		30 717		30 717	30 717
		30 718		30 718	30 718
91	Glass containers				
		32 211		32 211	32 211
		32 299 41		32 299 41	
				32 299 43	
	Except	32 211 76	*Except*	32 211 76	
				32 212	32 212
				32 219	32 219
		34 293 10			
92	Hydraulic cement				
		32 411		32 411	32 411
		32 412		32 412	32 412
93	Brick or blocks, clay or shale				
		32 511		32 511	32 511
	Except	32 511 10			
	---do---	32 511 25			
	---do---	32 511 30			
	---do---	32 511 36			
		32 711 20			
		32 512		32 512	32 512
		32 531 20		32 999 37	
94	Clay refractories				
		32 551		32 551	32 551
		32 999 15		32 999 15	
		32 992 15		32 999 69	
		32 959 14		32 552 48	32 552 48
95	Lime				
		32 741		32 741	32 741
96	Gypsum building materials				
		32 751		32 751	32 751
		32 752		32 752	32 752
		32 753		32 753	32 753
	Except	32 753 35			
		32 754		32 754	32 754

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966	1969	1972
96	Gypsum building materials—Continued			
	Except	32 754 30		
	---do---	32 754 69		
97	Mineral wool			
		32 961 15	32 961 15	32 961 15
		32 961 20	32 961 20	32 961 20
		32 961 21	32 961 21	32 961 21
		32 961 22	32 961 22	32 961 22
		32 961 40	32 961 40	32 961 40
		32 961 45	32 961 45	32 961 45
		32 961 65	32 961 65	32 961 65
		32 961 87	32 961 87	32 961 87
98	Pig iron			
		33 111 15	33 111 15	33 111 15
		33 111 30	33 111 30	33 111 30
		33 111 35	33 111 35	33 111 35
99	Semi-finished steel			
		33 121	33 121	33 121
	Except	33 121 55		
100	Manufactured iron or steel			
		33 122	33 122	33 122
	Except	33 122 35		
		34 433 38	34 433 38	
	Except	33 122 51		
	---do---	33 122 65		
		33 123	33 123	33 123
				34 994 75
	Except	33 123 20		
	---do---	33 123 26		
		33 124	33 124	33 124
	Except	33 124 34		
	---do---	33 124 35		
		33 127	33 127	33 127
		33 569 60	33 569 60	
		33 129 62	33 129 62	
		33 129 63	33 129 63	
		34 991 10	34 991 10	
		33 151	33 151	33 151
	Except	33 151 10		
	---do---	33 151 25		
		33 152	33 152	33 152
			34 994 70	
	Except	33 152 35		
	---do---	33 152 90		
		33 155	33 155	33 155
	Except	33 155 10		
			34 994 81	
			34 994 84	
			34 994 86	

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969	1972
100	Manufactured iron or steel—Continued				
		33 155 40	*Except*	33 155 40	
		33 219 72		33 219 72	33 219 72
		33 566		33 566	33 566
	Except	33 566 10			
	---do---	33 566 15	*Except*	33 566 15	
		33 911 26		33 911 26	33 911 26
		34 411		34 411	34 411
		34 439 67		34 439 67	
		34 998 65		34 998 65	
		33 126 23			
		34 449 48		34 449 48	
				34 994 15	34 994 15
				34 994 21	34 994 21
				34 994 23	34 994 23
				34 994 25	34 994 25
				34 994 52	34 994 52
				34 994 54	34 994 54
				34 994 60	34 994 60
				34 994 74	34 994 74
101	Iron or steel pipe, tubes or fittings				
		33 126		33 126	33 126
	Except	33 126 16			
	---do---	33 126 19			
	---do---	33 126 22			
	---do---	33 126 23			
	---do---	33 126 24			
	---do---	33 126 26			
	---do---	33 126 51			
	---do---	33 126 52			
	---do---	33 136 59			
	---do---	33 126 65			
	---do---	33 126 73			
102	Railway track material				
		33 128		33 128	33 128
103	Ferroalloys				
		33 131		33 131	33 131
		33 132		33 132	33 132
		33 133		33 133	33 133
		33 139		33 139	33 139
104	Primary copper products				
		33 311		33 311	33 311
		33 399 10		33 399 10	
		33 399 16		33 399 16	
		33 312 25		33 312 25	33 312 25
				33 511 30	33 511 30
105	Primary zinc products				
		33 331		33 331	33 331

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966	1969	1972
106	Primary aluminum products			
		33 341	33 341	33 341
107	Brass, bronze or copper basic shapes			
		33 511 10	33 511 10	33 511 10
		33 511 15	33 511 15	33 511 15
		33 511 20	33 511 20	33 511 20
		33 511 25	33 511 25	33 511 25
		33 512	33 512	33 512
		33 513	33 513	33 513
	Except	33 513 15		
	Except	33 513 20		
	---do---	33 513 25		
	---do---	33 513 30		
	---do---	33 513 35		
		33 519	33 519	33 519
		33 563 19	33 563 19	33 563 19
		33 563 25	33 563 25	33 563 25
		33 563 73	33 563 73	33 563 73
		33 572	33 572	33 572
		33 621	33 621	33 621
		33 699 10	33 699 10	33 699 10
		33 921 20	33 921 20	33 921 20
		33 921 25	33 921 25	33 921 25
		33 921 70	33 921 70	33 921 70
		33 992 15	33 992 15	33 992 15
		33 992 35	33 992 35	33 992 35
		33 992 50	33 992 50	33 992 50
		34 942 10	34 942 10	34 942 10
108	Aluminum basic shapes			
		33 521	33 521	33 521
	Except	33 521 20		
	--do---	33 521 30		
		33 523	33 523	33 523
		33 524	33 524	33 524
		33 529	33 529	33 529
	Except	33 529 15		
		33 571	33 571	33 571
		33 612 10	33 612 10	33 612 10
		33 921 10	33 921 10	33 921 10
		33 992 10	33 992 10	33 992 10
		34 412 10	34 412 10	34 412 10
		34 412 15	34 412 15	34 412 15
		34 412 20	34 412 20	34 412 20
		34 412 25	34 412 25	34 412 25
		34 412 30	34 412 30	34 412 30
		34 614 22	34 614 22	34 614 22
		34 619 10	34 619 10	34 619 10
		34 992 10	34 992 10	34 992 10
		34 992 15	34 992 15	34 992 15

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966		1969		1972
109	Metal containers		34 111		34 111	34 111
			34 912		34 912	34 912
		Except	34 912 14	*Except*	34 912 14	
		---do---	34 912 16	---do---	34 912 16	
		---do---	34 912 25	---do---	34 912 25	
		---do---	34 912 40	---do---	34 912 40	
				---do---	34 912 43	
		---do---	34 912 54	---do---	34 912 54	
			34 919		34 919	34 919
				Except	34 919 17	
				---do---	34 919 19	
		Except	34 919 26	---do---	34 919 26	
		---do---	34 919 28	---do---	34 919 28	
		---do---	34 919 34	---do---	34 919 34	
		---do---	34 919 35	---do---	34 919 35	
		---do---	34 919 38	---do---	34 919 38	
		---do---	34 919 56	---do---	34 919 56	
		---do---	34 919 62	---do---	34 919 62	
		---do---	34 919 64	---do---	34 919 64	
		---do---	34 919 66	---do---	34 919 66	
		---do---	34 919 72	---do---	34 919 72	
		---do---	34 919 73	---do---	34 919 73	
		---do---	34 919 82	---do---	34 919 82	
		---do---	34 919 84	---do---	34 919 84	
110	Farm machinery		35 222		35 222	35 222
			34 999 95		34 999 95	
			35 223		35 223	35 223
			35 224		35 224	35 224
			35 225		35 225	35 225
			35 227		35 227	35 227
			35 229		35 229	35 229
		Except	35 229 42	*Except*	35 229 42	
		---do---	35 229 43	---do---	35 229 43	
		---do---	35 229 44	---do---	35 229 44	
		---do---	35 229 46	---do---	35 229 46	
		---do---	35 229 47	---do---	35 229 47	
		---do---	35 229 48	---do---	35 229 48	
		---do---	35 229 77	---do---	35 229 77	
		---do---	35 229 80	---do---	35 229 80	
				---do---	35 229 92	
				---do---	35 229 93	
111	Heavy machinery		35 112		35 112	35 112
			35 113			
			35 311		35 311	35 311
			35 312		35 312	35 312
			35 313		35 313	35 313

STCC code conversion table (STCC lists)—Continued

Commodity group No.	1966	1969	1972
111 Heavy machinery—Continued			
		35 999 77	
	35 314	35 314	35 314
	35 316	35 316	35 316
	35 318	35 318	35 318
	35 319	35 319	35 319
	35 321	35 321	35 321
	35 322	35 322	35 322
	35 329	35 329	35 329
	35 331	35 331	35 331
	35 332		
	35 339	35 339	35 339
	35 333		
	35 341	35 341	35 341
	35 351	35 351	35 351
	35 352		
	35 361	35 361	35 361
	35 362	35 362	35 362
	35 371	35 371	35 371
	35 372		
		41 111 95	
		Except 35 371 77	
	35 412	35 412	35 412
	35 413		
	35 414		
	35 415		
	35 416		
	35 418		
	35 419		
	35 421	35 421	35 421
	35 422		
	35 425		
	35 426		
	35 428		
	35 429		
	35 481	35 481	35 481
	35 489	35 489	35 489
	35 482		
	35 483		
	39 998 38	39 998 38	
	35 511	35 511	35 511
	35 512	35 512	35 512
	35 513	35 513	35 513
	35 514	35 514	35 514
	35 515	35 515	35 515
	35 516	35 516	35 516
	35 519	35 519	35 519
	35 522	35 522	35 522
	35 521		

STCC code conversion table (STCC lists)—Continued

Commodity group No.	1966	1969	1972
111	**Heavy machinery—Continued**		
	35 531	35 531	35 531
	35 541	35 541	35 541
	35 552	35 552	35 552
	35 551		
	35 591	35 591	35 591
	35 592	35 592	35 592
	Except 35 592 28	*Except* 35 592 28	
	35 594	35 594	35 594
	35 593		
	35 595	35 595	35 595
	35 596	35 596	35 596
	35 597	35 597	35 597
	35 599	35 599	35 599
		41 111 05	
	35 611	35 611	35 611
	35 613	35 614	35 614
	35 614		
	35 615		
	35 616		
	Except 35 616 30		
		Except 35 611 24	
	Except 35 616 20		
		Except 35 611 26	
	35 619	35 619	35 619
	35 641	35 641	35 641
	35 999 34	35 999 34	
	35 999 35	35 999 35	
		35 999 36	
	35 642	35 642	35 642
	35 669	35 669	35 669
	Except 35 669 52		
	---do--- 35 669 53		
	---do--- 35 669 54		
	---do--- 35 669 74		
	35 671	35 671	35 671
	34 433 28	34 433 28	
	35 691	35 691	35 691
	35 821	35 821	35 821
	35 822	35 822	35 822
	35 851	35 851	35 851
		35 859 61	
	35 853	35 853	35 853
		25 421 74	
		25 421 75	
	35 854	35 854	35 854
	35 855	35 855	35 855
	Except 35 855 10		
	35 856	35 856	35 856

STCC code conversion table (STCC lists)—Continued

Commodity group No.		1966	1969	1972
112	Major household appliances			
		36 311	36 311	36 311
			34 334 30	
		36 321	36 321	36 321
		36 331	36 331	36 331
		36 332	36 332	36 332
		36 392 15	36 392 15	36 392 15
		36 393	36 393	36 393
113	Household radios or television sets			
		36 511	36 511	36 511
		36 791 45	36 791 45	
		34 619 80	34 619 80	
		36 512	36 512	36 512
114	Motor passenger cars, assembled			
		37 111	37 111	37 111
115	Motor vehicles, assembled (Other Than Passenger Cars)			
		37 112	37 112	37 112
		37 113	37 113	37 113
		37 119	37 119	37 119
		37 999 77	37 999 77	
		37 999 78	37 999 78	
		37 151	37 151	37 151
116	Motor vehicle parts			
		34 613	34 613	34 613
		37 142	37 142	37 142
		37 143	37 143	37 143
		37 144	37 144	37 144
		37 145	37 145	37 145
		37 146	37 146	37 146
		37 141		
		37 131	37 147	37 147
		37 121	37 149	37 149
		37 149		
	Except	37 121 10		
	---do---	37 121 12		
	---do---	37 121 14		
	---do---	37 121 18		
	---do---	37 121 22		
	---do---	37 121 26		
	---do---	37 131 10		
	---do---	37 131 15		
	---do---	37 131 20		
	---do---	37 131 21		
	---do---	37 131 25		
	---do---	37 131 35		
	---do---	37 131 40		
	---do---	37 131 45		
	---do---	37 131 90		
		37 148	37 148	37 148

STCC code conversion table (STCC lists)—Continued

Commodity group No.	1966			1969	1972
116	Motor vehicle parts—Continued				
		37 132 16			
		37 132 15			
117	Locomotive or railway car parts				
		37 413		37 413	37 413
		37 426		37 426	37 426
		37 428		37 428	37 428
	Except	37 428 15	*Except*	37 428 15	
		37 429		37 429	37 429
118	Iron or steel scrap				
		40 211		40 211	40 211
	Except	40 211 30	*Except*	40 211 30	
119	Non-Ferrous metal scrap				
		40 212		40 212	40 212
	Except	40 212 30	*Except*	40 212 30	
	---do---	40 212 45	---do---	40 212 45	
	---do---	40 212 71	---do---	40 212 71	
		40 213		40 213	40 213
		40 214		40 214	40 214
		40 219		40 219	40 219
	Except	40 219 82	*Except*	40 219 82	
120	Textile waste or scrap				
		40 221		40 221	40 221
	Except	40 221 12			
121	Paper waste or scrap				
		40 241		40 241	40 241
122	Chemical or petroleum waste				
		40 251		40 251	40 251
		28 184 50			
123	Shipping containers or devices, returned empty				
		42 111		42 111	42 111
		42 112		42 112	42 112
124	Freight forwarder traffic				
		44 111		44 111	44 111
125	Shipper association traffic				
		45 111		45 111	45 111
126	Miscellaneous mixed shipments				
		46 111		46 111	46 111
		46 211		46 211	46 211

INDEX DIGEST

Volume II (Pages 867-2090)

A

ACCOUNTS AND ACCOUNTING
  Account 76, interest during construction 1503, 1519, 1540, 1605
  Account 80, historic and new book values 1503, 1537, 1604
  Account 90, construction work in progress 1503, 1519, 1540, 1605
  Account 402, train supplies and expenses 541
  Account 532, railway tax accruals 1572, 1605
  Account 735, accrued depreciation 1523
  Accounts 2 1/2, 3, 5, and 39 should be fully depreciable 1535, 1604
  Accounts 18, 19, 20, deficient 1525
  Betterment v. depreciation 1535
  Price level, rejected 1572
  Railroads' accumulated depreciation account, preliminary computer analysis of 410
  Railroads, new system required by Railroad Revitalization Act 1572, 1598
  Retirement v. depreciation 1534
  Revisions to reflect cost function and estimating procedures, recommended 2054

ADEQUATE AND EFFICIENT SERVICE
  Coal transportation, future economic factors 354
  Iron ore traffic, railroads provide 829, 842
  Railroad freight service investigation 1223, 1309, 1363
  Scrap, railroads provide 1192

AIR TRANSPORTATION
  Federal subsidies 1281

ALLOWANCES
  Tank cars, shipper-owned 1722

ANNUAL VOLUME RATES
  Coal 107, 182, 313, 514, 519

ANTITRUST ACTS
  Commission's power to suspend rates, distinguished 368

B

BETTERMENT ACCOUNTING See DEPRECIATION

BILLING See SHIPPERS

BONDS See RAILROADS

BUDGETARY SUPPORT See INTERSTATE COMMERCE COMMISSION

BURDEN OF PROOF
  Petitioners, to show violations of the act, rate structure investigation 1392
  Railroad rate structure investigation data, use of will not alter burden in individual rate or general increases 500

BURDEN STUDY See REVENUES

C

CAPITAL See also WORKING CAPITAL
  Equity, cost of 1650, 2020
  Funds flow analysis to determine future need for 1575
  Railroads' needs far exceed ability to acquire 1562

CAR-MILE EARNINGS See REVENUES

CARS See also EQUIPMENT
  Assigned and special, effect on service 1307
  Car service, Commission's jurisdiction 1232, 1236, 1263

CARS—Continued .
- Cleaning of 1276
- Empty, movements of 1262
- Federal purchase of, discussed 366, 527
- Free-running 1274
- Gondola, scrap moves in 969, 1189
- Hopper
  - Coal, demand for 358, 364, 526
  - Iron ore transportation 828
- Investment required, for adequate coal transportation 364, 366, 372, 524
- Large, costs and savings 109
- Railbox classed as private 1803
- Shortage
  - Commission's policy to correct, by means other than rate increases 527
  - Freight cars, problem and remedies 1271
  - Train II information, access to 1275
- Tank, shipper-owned, allowances 1722

CHARGE COVERAGE
- Fixed and contingent, decline of 1561

CLASS RATES
- Coal 106, 280, 314, 506

COAL See also INVESTIGATIONS; SPECIFIC HEADINGS
- Increasing demand for 106, 359, 363
- Railroad freight rate structure investigation 71, 73, 372, 493, 537
  - Rates overall compensatory and not unreasonably high, although some fall below zone of reasonableness 372, 512
  - Transportation conditions, eastern v. western States 532
  - Transportation costs and 92, 315, 496, 510
  - Types of 79

COAL-SLURRY See PIPELINES

COMMODITY RATES
- Coal, types of 106
- Iron ore traffic moves under point-to-point 821
- Scrap, scale rates described by territory 991

COMPARISON OF RATES See RATE COMPARISONS

COMPENSATORY RATES
- Coal rates are generally 315, 322, 332, 372, 512
- Iron ore rates are generally 701, 728, 777, 842
- Scrap rates are generally 1102, 1169, 1199

COMPETITION
- Coal rates, effect 92, 107, 133, 283, 313, 317, 339, 519, 532
- Export-import rates, Great Lakes, effect 1418
- Freight rate structure brought into line with cost levels and market conditions by 2045
- Iron ore rates, effect 674, 687, 820
- Scrap and iron ore
  - Discussed 1157, 1177, 1199
  - History of cases 1158

COMPLAINTS
- Absence of, favorable factor in measuring reasonableness, coal rate structure 316

CONCENTRATION RATES
- Coal 107, 109

CONDITIONAL RATES
- Coal 107

CONFERENCES See RAILROADS

CONGLOMERATES
- Railroad diversification, effect on earnings 1508, 1557, 1569

CONSTRUCTION See INTEREST

CONTAINER-ON-FLATCAR RATES
- Export-import, Great Lakes ports, found just and reasonable, not unduly preferential and prejudicial 1401, 1438

CONTINGENT CHARGES See CHARGE COVERAGE

CONTRACT RATES
- Canadian practices 1289
- Railroad Revitalization Act and 1289
- Unlawful per se 1288

COORDINATOR See INTERSTATE COMMERCE COMMISSION

COST OF SERVICE
- Coal transportation
  - Adjusted regional average costs properly used 503
  - Conclusions, types of coal 313, 322, 332
  - Findings tentative 500
  - Rates studied found to be representative 500
  - Territorial average costs adjustment, methodology 540
  - Typical rates 225
- Cost studies
  - Coal traffic
  - Opportunity to submit, ciscussed 498
  - Steel and electric utility interests 225, 281
  - Iron ore traffic
  - Cleveland to Weirton, W. Va. 734
  - Ex-lake 743
  - Four steel companies 764
  - Import 737
  - Southern Railway 753
  - Upper lake ports 759
  - Scrap iron and steel 1050, 1080, 1093, 1102
- Iron ore transportation
  - Consumption, effect on 667
  - Rate structure in terms of 822
  - Repetitive movements 691
- Methodologies, reevaluation of, needed 2046, 2054
- Railroad freight rate structure investigation, contracted cost analysis study 15
- Rates exceeding fully allocated costs not necessarily exceeding maximum reasonable level 439
- Reasonableness, not only criterion of 505
- Scrap iron and steel, revenue/cost relationships with iron ore 1167, 1183
- Variable and fully allocated
  - Coal 226, 504
  - Iron ore 699, 774
  - Rates exceeding fully allocated, not necessarily exceeding maximum reasonable level 439
  - Scrap iron and steel 1062
- Wheat from North Dakota to Pacific coast 438

COST STUDIES See COST OF SERVICE

D

DATA BANK
- Permanent, rail traffic, costs, etc., recommended 367, 373, 534, 2054

DEBT
- Costs of, calculation 1650, 1884
- Railroads' maturing, ability to service 1559

DEMURRAGE
- Free-time allowances and, impact on rail freight service 1282
- Reciprocal, concept rejected 1290

DEPARTMENT OF TRANSPORTATION
- Federal railroad aid study 1282
- Waybill sample discussed 366, 372, 534

DEPRECIATION See also FAIR RETURN ON INVESTMENT
- Accounts 2 1/2, 3, 5, and 39 should be fully depreciable 1535, 1604
- Accrued
  - Deficiences, factors causing 1524
  - Discussed 1502, 1522, 1537, 1730
  - Excesses, factors causing 1525
  - Salvage a credit to 1525
- Betterment accounting v. 1502, 1535, 1743
- Cyclical review of 1537, 1604
- Equipment, statistical methods 414, 1524, 1741
- General observations on 1537
- Net operating income and investment, use in calculation of 1502

DEPRECIATION—Continued
Nondepreciable, status of property now classified as 413, 1533, 1604
Original v. replacement cost, net investment base 1520
Premature obsolescence, writeoffs for 1520
Railroads' accumulated depreciation account, preliminary computer analysis of 410
Railroads should submit studies of 1537, 1604
Rates of, prescription 1523, 1531, 1604
Retirement accounting v. 1534, 1742
Simulated plant record method 1524, 1742
Straight-line
Accelerated v. 1522
Should be retained 1604

DIFFERENTIALS
Coal 118, 313, 337, 341, 519
Distortions caused by general increases 2052

DISCRIMINATION
Export-import rates
Great Lakes ports, not shown to constitute 1412
Pacific and overland common point territory, between, not in violation of §2 or §3 442
Scrap, single-car rates, iron-ore trainload rates not discriminatory against 1178, 1199

DISPATCH See REASONABLE DISPATCH

DIVERSIFICATION See CONGLOMERATES

DIVIDENDS See also STOCK
Commission jurisdiction over 1571
Expedited proceedings, regulations for 2051
Railroads, payments discussed 59, 66, 1570, 1605, 1711, 1717

DOMESTIC RATES
Restrictions prohibiting application of, on export-import traffic to and from Great Lake ports, not shown unjust and unreasonable 1411

E

EARNINGS MARGIN See RAILROADS

ELECTRIFICATION See RAILROADS

ELKINS ACT
§41(1): 1261

EMPLOYEES
Labor relations outside Commission's competence 1302
Railroads, compensation and reduction in number 1717, 1776

ENVIRONMENT See NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

ENVIRONMENTAL PROTECTION AGENCY
Scrap iron and steel transportation, cost study 1080, 1102

EQUIPMENT See also CARS
Depreciation, statistical methods 414, 1523, 1741
Expenditure projection 1803
Investment required, for adequate coal transportation 364, 366, 372, 524
Large cars, costs and savings 109
Leasing, major factor in increasing total interest charges and rents 1561
Shipper-owned, allowances 1722

EQUITY CAPITAL See CAPITAL

EQUITY FUNDS See INTEREST

EVIDENCE
Cost
Complaint proceedings 1394
Great Lakes, export-import rate investigation, lack of 1394
Wheat from North Dakota to Pacific coast 438

EX-LAKE RATES See also LAKE-CARGO RATES
  Iron ore 655, 661, 679, 746, 819, 825, 839, 842

EX PARTE
  No. 270: 1, 2042
  No. 270 (Sub-No. 1A): 423
  No. 270 (Sub-No. 1B): 1364
  No. 270 (Sub-No. 2): 1223
  No. 270 (Sub-No. 3): 2048
  No. 270 (Sub-No. 4): 71, 493
  No. 270 (Sub-No. 5): 548
  No. 270 (Sub-No. 6): 867
  No. 270 (Sub-No. 9): 2053
  No. 271: 55, 410, 1494

EXPORT-IMPORT TRAFFIC See also INVESTIGATIONS; SPECIFIC HEADINGS
  Coal, export rates 107, 202
  Domestic rates, history of relation to 1402
  Grains and soybeans, export, interior points to Duluth, Toledo, Chicago, not shown unjust and unreasonable 1441, 1450
  Great Lakes ports, railroad freight rate structure 1364, 1451
  Iron ore, import rates 664, 685, 687
  Pacific coast, railroad freight rate structure 423, 442
  Tidewater ports, traffic through, history 1415

F

FAIR RETURN ON INVESTMENT See also DEPRECIATION; VALUATION
  Funds flow analysis to determine revenue need 1573, 1595
  General increases
    Coal, and 356, 518
    Technological advances not, will increase earned rate of return 1568, 1602
    Use of concept in 60, 1499, 1565
  General revenue standards, history of 1543, 1565
  Indicator of relative profitability not standard of reasonable earnings 1497
  Iron ore, transportation of 842
  Level of
    Discussed 60
    Provisions of Interstate Commerce Act take precedence over concept 56
    Required 1558, 1563, 1567, 1589, 1603, 1605
  Net investment base
    Calculation of 1499, 1519
    Original cost not fair value 1499
    Original cost, should be retained 1604
    Reasonably stated, but both reported and calculated should be used in general increase cases 1543
    Reported and calculated, compared 1526, 1533
    Public utilities distinguished from railroads 1497
  Railroads, net investment, rate base and rate of return
    Conclusions 1492, 1494, 1604
    Future course of proceeding determined 55
    Preliminary computer analysis of accumulated depreciation account 410
  Rate base
    Computation of 1612, 1658
    Definitions of 1518
    Special projects counsel claims overvalued 1608, 1615
    Timing measurements 1543, 1605
    "Used or useful," rejected 1520, 1619
  Rate of return formula 1499, 1747
  Reasonableness of rates, considered in 60, 1499
  Revenue levels, establishment of adequate, required by Railroad Revitalization Act 1596, 1606

FINANCIAL CONDITIONS
  Coal transportation, railroads 310
  Iron ore transportation, railroads 792, 829
  Scrap transportation, railroads 1128

FIXED CHARGES See CHARGE COVERAGE; RAILROADS

FORMS See also RAILROADS
  Form R-1 1524
  Statistical Series Circular No. 31, revised 6[illegible], 68

FREE TIME See DEMURRAGE

FREIGHT, ALL KINDS RATES
  Export-import, Great Lakes ports, found just and reasonable not unduly preferential and prejudicial 1401, 1438

FREIGHT COMMODITY STATISTICS
  Traffic data, altered compilation of, suggested 801, 842

FREIGHT RATE STRUCTURE See INVESTIGATIONS; RATE STRUCTURE

FREIGHT SERVICE See also INVESTIGATIONS; RAILROADS; SPECIFIC HEADINGS
  Commission's jurisdiction over 1234
  Found inadequate 1306, 1310
  Meaning of adequate 1248
  Railroad, investigation 1223, 1309, 1363

FUNDS FLOW ANALYSIS See also REVENUES
  Analysis of results 1599
  Determination of railroad revenue need 1512, 1573, 1588, 1596
  Funds flow group, establishment of recommended 1599, 1605
  General increases, use in 1574, 1595, 1605
  Methodologies 1578, 1755
  Projected, model 1575, 1936
  Uses of 1595

G

GATHERING RATES
  Coal 107

GENERAL INCREASES See INCREASED RATES

GENERAL TRANSPORTATION IMPORTANCE
  Allegations of, not importance, proceeding pending before entire Commission 1374

GOVERNMENT TRAFFIC
  Legislative recommendation, §22, eliminate free ore reduced rates for 5

GRAIN AND GRAIN PRODUCTS
  Grains and soybean export rates, interior points to Duluth, Toledo, Chicago, not shown unjust and unreasonable 1441, 1450
  Rate structure investigation continued under general Commission supervision 2053

GREAT LAKES PORTS See PORTS

GROUP AND GROUP RATES
  Coal 118, 182, 313, 341, 348
  Iron ore, destinations, described 680, 746, 819

H

HEARINGS
  Oral, denied 1374

HOCH SMITH RESOLUTION
  Declaratory merely 1551

HOUSEHOLD GOODS
  Reasonable dispatch 1264

I

IMPORT TRAFFIC See EXPORT-IMPORT TRAFFIC

INCREASED CHARGES
  Ex-lake railroad docks, iron ore handling 839

INCREASED RATES
  General increases
    Carriers filing for percentage, must consider anticipated effects on long- and short-haul traffic 436

Coal
  Individual railroads, effect on 352, 523
  Rate structure, effect on 334, 337, 354, 372, 519
Distortions in rate patterns by, not serious 2052
Earmarking for capital improvements 1279,1294
Evidentiary requirements, bearing on uneven effect on individual railroads 2049
Export-import rates, Pacific coast, and 434
Funds flow data used in 1574, 1595, 1605
General revenue standards, history of 1543
Groups or districts, treatment of railroads as 2049
Horizontal percentage and sliding scale, discussed 434
Inflation
  Appropriate response to 2046
  Projections to offset 1602
Iron ore
  Generate adequate revenue 829, 842
  History 670
  Individual railroads, effect on 827, 833, 842
  Rate structure, effect on 681, 816, 825, 842
Necessary not self-defeating 2046, 2051
Railroad freight rate structure investigation and 3, 11, 13
Rate of return on investment, use of, in 60, 1499, 1565
Revenue need not rate of return primary factor considered 60
Scrap iron and steel
  Environmental considerations 1166
  Generate adequate revenues 1192, 1200
  History of 991
  Rate structure, effect on 1178
  Recommendations 1200
Selectivity and holddowns and necessary 2046
Uneven effect on individual railroads, investigation discontinued 2048
Will not increase earned rates of return 1567
345 I.C.C.

INFLATION
  Financial data, adjustment of, use of constant as well as actual dollars 1605
  Financial statements, adjustments of 1653
  General increases, projections to offset 1602, 1605
  Railroad net income, impact on 1565
  Rate of return not rate base adjustment solution to problem of 1520, 1661
  Revenue need, considered 1573

INTERCOMMODITY RATE RELATIONSHIPS See RATE STRUCTURE

INTEREST See also DIVIDENDS
  Account 76, modification to include imputed interest on equity funds tied up in new construction rejected 1540, 1605

INTERMODAL TRANSPORTATION
  Commission's broader view of, under NTP 1238

INTERSTATE COMMERCE ACT
  Legislative history
    §15a(2): 1550
    §19a(f): 1517
    Transportation Act of 1920 1236
  Legislative recommendations
    §1(15): 1263
    §22: 5
  §1(4): 1236, 1240
  §1(4)(a): 1232, 1241, 1276
  §1(6): 1282
  §1(10): 1236, 1272
  §1(11): 1240
  §1(13): 1240
  §1(15): 1236, 1241
  §1(21): 1236, 1272
  §3(1): 1397
  §4: 1308
  §12(1): 1240
  §12(2): 1240
  §13(2): 1237, 1392
  §13(4): 839
  §15: 1237
  §15(1): 443, 1394
  §15(8): 1307
  §15(11): 536

INTERSTATE COMMERCE ACT—Con.
  §15a(2): 1546, 1550, 1566
  §15a(3): 1546, 1566
  §15a(4): 1566
  §19a(f): 1500, 1517
  §20(3): 1598
  §20(3)(a): 1572
  §20(11): 1287, 1291, 1293
  Specific provisions of, take precedence over rate of return concept 56

INTERSTATE COMMERCE COMMISSION
  Budgetary support (pamphlet) 6, 14
  Bureau of Economics, reorganization recommended 2054
  Coordinator, rate structure reports of 1, 55, 71, 410, 551, 870, 1224, 1495, 2042
  Data on freight service, expansion required 1310
  Entire Commission proceedings 424, 1364
  Innovative ratemaking encouraged 1289
  Jurisdiction
    Car service 1232, 1236, 1263
    Dividends, approval of 1571
    None, expand or limit carrier's liability for refusal or delay to serve 1293
    Railroad freight service investigation 1234
  Labor relations outside competence of 1302
  Legislative recommendations
    Amend §1(15), car service powers 1263
    Earnmarking rate increases for capital improvements 1280
    Eliminate free or reduced rates for government traffic 5
    Transfer of railroad assets to holding companies 1282
  Policy
    Federal aid to railroads 527
    Rate structure, continuing informal study of 2055
    To correct car shortage by means other than rate increases 527
  Power, suspend rates, distinguished from antitrust regulations 368
  Rail Public Counsel Office, establishment recommended 2054
  Suspension and Fourth Section Board, reconstruction recommended 368, 372, 534
  "Third party" protecting public interest 2046

INTRASTATE RATES
  Coal rate structure, distortions in, caused by delay in granting ex parte increases 339
  Iron ore rate structure, influence on 834
  Scrap rate structure, influence on 1193

INVERSE RATES
  Anomaly in the rate structure, to be justified by special circumstances 441
  Overland common point territory to Pacific, wheat, unreasonable 441, 443

INVESTIGATION AND SUSPENSION
  Distinguished from antitrust post-injury protection 368
  Reconstruction of suspension procedures recommended 368, 372, 534

INVESTIGATIONS
  Railroad freight rate structure (Ex Parte No. 270)
    Advisory opinion merely 500, 511, 537
    Central purpose 3, 13
    Coal (Sub-No. 4)
    Conclusions 71, 372
    Supplemental report 493, 537
    Table of contents 73
    Coordinator, reports of 1, 55, 71, 410, 551, 870, 1224, 1495, 2042
    Environmental considerations 13, 370
    Export-import rates, Great Lakes ports (Sub-No. 1B), conclusions 1364, 1451
    Export-import rates, Pacific coast (Sub-No. 1A), conclusions 423, 442
    Final report, conclusion 2042, 2054
    Freight service (Sub-No. 2)
    Conclusions 1223, 1309
    Table of contents 1363
    General observations drawn from 2044

    - Grain and grain products (Sub-No. 9), continued under general Commission supervision 2053
    - Iron ores (Sub-No. 5)
      - Conclusions 548, 842
      - Table of contents 550
    - Scrap iron and steel (Sub-No. 6)
      - Conclusions 867, 1199
      - Table of contents 869
    - Special projects counsel 7
    - Status report 1
    - Uneven effects of general increases on individual railroads (Sub-No. 3), discontinued 2048
  - Railroads, net investment, rate base, and rate of return (Ex Parte No. 271)
    - Conclusions 1494, 1604
    - Future course of proceeding determined 55
    - Preliminary computer analysis of accumulated depreciation account 410
    - Table of contents 1492

INVESTMENT See FAIR RETURN ON INVESTMENT; INVESTIGATIONS

IRON ORE See also INVESTIGATIONS; SPECIFIC HEADINGS
- Definition 555
- Rail transport of, conditions not optimum but as favorable as any other commodity 643, 842
- Railroad freight rate structure investigation 548, 550, 842
- Rate, revenue, and cost comparisons with scrap 1156, 1167
- Rate structure by territories 670
- Rates, effect on consumption of 667
- Regularity of traffic flow 571
- Scrap iron See SCRAP IRON AND STEEL
- Transportation characteristics 679, 976, 1199

L

LABOR See EMPLOYEES

LAKE-CARGO RATES See also EX-LAKE RATES
- Coal 107, 158, 511

LAKE MOVEMENTS See EX-LAKE RATES

LEASE AND LEASING
- Equipment, major factor in increasing total interest charges and rents 1561

LEGISLATIVE HISTORY See INTERSTATE COMMERCE ACT

LEGISLATIVE RECOMMENDATIONS See INTERSTATE COMMERCE ACT; INTERSTATE COMMERCE COMMISSION

LIQUITY
- Railroads
  - Current ratio 1560
  - Projected 1603, 1932
  - Working capital, computation of 1542

LOADING AND UNLOADING
- Iron ore 646, 650, 655
- Scrap iron and steel 969

LOSS AND DAMAGE
- Claims, iron ore, very low 658

M

MOTOR CARRIERS
- Coal transportation 97
- Long-haul patterns compared with railroads 1624
- Right-of-way maintenance 1281
- Scrap transportation 998

MULTIPLE-CAR RATES See also TRAIN-LOAD RATES; UNIT-TRAIN RATES
- Coal 106, 216, 313, 322
- Concentration rates 109
- History 111
- Iron ore
  - Earnings and costs 692, 701, 728, 1177, 1183
  - Revisions suggested 823
- Scrap iron and steel, earnings and costs 1028, 1102
- Trainload rates and 106, 512

N

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969
  Freight rate structure investigation and 13
  Impact statement, timing considered 370
  Iron ore production, environmental impact 571, 623
  Railroad coal rate structure investigation and 370, 537
  Railroads, net investment, rate of return, proceeding's environmental effect 61
  Scrap iron and steel, environmental impact 895, 946, 1166, 1196

NATIONAL TRANSPORTATION POLICY
  Enforced to same extent as other provisions of the act 1238
  Railroad freight service, Commission's jurisdiction 1239
  Railroads, inherent advantages 1238

NET INVESTMENT See FAIR RETURN ON INVESTMENT; INVESTIGATIONS

NET OPERATING INCOME See RAILROADS

O

OPERATING INCOME See RAILROADS

ORDER
  Show cause, prescribe export rates on wheat, overland common point territory to Pacific 442, 447

P

PACIFIC COAST PORTS See PORTS

PER CAR RATES
  Coal 106, 133, 176, 214, 278, 313, 508, 531
  Iron ore
    Earnings and costs 692, 701, 728
    Revisions suggested 822
  Scrap iron and steel
    Basically moves under 969
    Earnings and costs 1028, 1102, 1177, 1183, 1199

PER DIEM CHARGES
  Fractional, AAR adoption of 1276
  Incentive, impact on car shortages 1272

PIPELINES
  Coal-slurry transportation 97, 363, 532

PORTS
  Equalization
    Evidence required 1417
    Iron ore rates 685
    Policy to maximize number of ports available 1397
    Rates, use of ocean rates and through transportation costs in determining lawfulness of 1393
    West bank Lake Michigan ports, denied 1398
  Great Lakes, export-import railroad freight rate structure investigation 1364, 1451
  Pacific coast, export-import railroad freight rate structure investigation 423, 442

PRACTICE AND PROCEDURE
  Irregularities are not per se prejudicial 499

PREFERENCE AND PREJUDICE
  Absolute amount, rates complained of lower than compared rates, violation can be found 1377, 1417
  Bentonite clay, export shipments through Great Lake ports not shown unduly prejudicial 1438
  Class and commodity rate comparisons 506
  Class-rate structure, factors other than, used in establishing 1413
  Competitive injury, showing required by shipper and by locality 1429
  Export-import rates, between north Pacific and overland common point territory, not in violation of §2 or §3 442

Grain and soybean export rates, interior points to
  Chicago, unduly prejudicial to, and unduly preferential of gulf ports 1450
  Duluth and Toledo, not shown unduly preferential or prejudicial 1441
Great Lakes ports, general commodity, grain, TOFC/COFC, and FAK export-import rates not shown unduly prejudicial to, and unduly preferential of tidewater ports 1438
Showing to establish 1413, 1417, 1429

PRESCRIPTION OF RATES
  Cost evidence required to justify 1394, 1439
  Factors required under §15(1) 443
  Iron ore, ex-lake, can change in face of altered circumstances 681, 819
  Shipside rates, Great Lakes ports, denied 1395

PRICE LEVEL ACCOUNTING See ACCOUNTS AND ACCOUNTING

PRIVATE CARS See CARS

PRIVATE RAILROADS See RAILROADS

PROPORTIONAL RATES
  Lake-cargo rates, coal 161

PUBLIC UTILITIES
  Railroads distinguished from, rate of return on investment 1497

R

RAIL FORM A See RAILROADS

RAILBOX See CARS

RAILROAD REVITALIZATION AND REGULATORY REFORM ACT OF 1976
  Funds flow analysis, use in establishing revenue levels 1596, 1606
  General increases, uneven effect on railroads, provisions applicable to problem 2050
  Innovative ratemaking promoted 1289, 2046, 2051
  Purpose 1231, 1239, 1245
  Railroads, new accounting system required 1572, 1598
  Rule of ratemaking 1566
  §201: 2051
  §205: 1566, 1596
  §211: 1262, 1282
  §212: 1241, 1262, 1276
  §307: 1598
  §902: 1282
  §903: 1569

RAILROADS
  Accounting system, new, to be promulgated 1572, 1598
  Bond ratings, comparative 1663
  Capital needs for replacement and modernization far exceed ability to acquire new capital 1562
  Common stock ratings, comparative 1663
  Data bank, recommended 367, 373, 511, 521, 2054
  Diversification, effect on earnings 1508, 1557, 1569
  Dividend payments discussed 59, 66, 1570, 1605, 1711, 1717
  Earnings margin, decline of 1564
  Electrification of 1296
  Employees, compensation and reduction in number 1717, 1776
  Excess capacity problem 1615, 1624
  Federal aid to 527, 1282
  Financial data
    Coal transportation 310
    Iron ore transportation 792, 829
    Scrap transportation 1128
  Financial instability, indicators of 1664
  Fixed charges, ratio to operating income and equity income 1668
  Freight rate structure investigation
    Coal 71, 73, 372, 493, 537
    Export-import, Great Lakes ports 1364, 1451
    Export-import, Pacific coast 423, 442
    Final report, conclusion 2042, 2054
    Freight service 1223, 1309, 1363
    Grain and grain products, continued under general Commission supervision 2053

RAILROADS—Continued

- Freight rate structure - investigation—Continued
  - Iron ores 548, 550, 842
  - Scrap iron and steel 867, 869, 1199
  - Status report 1
  - Uneven effects of general increases, discontinued 2048
- Inherent advantages of 1238
- Labor-management relations 1303
- Liquity 1542, 1560, 1603
- Long-haul patterns compared with motor carriers 1624
- Must consider anticipated effects on long- and short-haul traffic in filing for general increases 436
- Nationwide network, interdependent 1225, 1248
- Net investment, rate base and rate of return
  - Accumulated depreciation account, preliminary analysis of 410
  - Conclusions 1492, 1494, 1604
  - Future course of proceeding determined 55
- Net operating income, computation of 1611
- Privately owned, iron ore traffic 818
- Profitability, decline of 1609
- Public utilities distinguished, rate of return 1497
- Rail Form A
  - Iron ore traffic 741, 753, 763
  - Methodological innovations within framework of 2046
  - Scrap iron and steel, cost studies 1053, 1093
  - Station clerical adjustment, multiple-car coal rates 541
  - Wheat from North Dakota to Pacific coast 438
  - Working capital, computation of 1541, 1605
- Railroad Freight Service Report (BOp 105) 1225, 1226, 1311, 1362
- Rails of, must be open from one end to the other 1411
- Revenue contribution (burden study) 10, 26, 1116, 1127
- Service schedules, publication requested 1259, 1349
- Shippers, conferences with 1295
- Short trains, utilization of 1299
- Technological advances not general increases will increase earned rate of return 1568, 1602
- Terminal operations, service formula discussed 1266, 1360
- Track maintenance and rehabilitation 1278

RATE BASE See FAIR RETURN ON INVESTMENT; INVESTIGATIONS

RATE COMPARISONS

- Car-mile earnings 1381, 1399, 1424
- Coal
  - Commodity and class rates 506
  - Revenue yields and costs, various types of service 225, 495
  - Volume and single-car rates 508
- Commodities and points not shown typical of the traffic 1381
- Different minimum weights, rates at 1381
- Domestic and export-import rates 1402
- Iron ore
  - Captive and noncaptive 820
  - Relative unreasonableness, showing of 821
  - Scrap and 1157, 1177
  - Variable and fully allocated costs 699
- Mileage differences between interior points and Great Lakes and tidewater ports, lessens value of 1381
- Relative reasonableness established by 821
- Similar transportation conditions, factors considered 1400, 1402
- Tidewater ports, should utilize Baltimore as key port in North Atlantic range, New Orleans in gulf range 1444

RATE OF RETURN See FAIR RETURN OF INVESTMENT; INVESTIGATIONS

RATE STRUCTURE See also INVESTIGATIONS; SPECIFIC HEADINGS

- Building of, considerations 77
- Changes in, circumscribed by economic realities 2047

  Competition and regulation bring into line with cost levels and market conditions 2045
  Continuing informal study of 2053, 2055
  Distortions in, by general increases, not serious 2052
  Flexibility of, to market circumstances 2045
  Inconsistencies and distortions of, minor; should be resolved through informal Commission proceedings 2045
  Innovation in, not prevented by regulation 2045, 2052
  Intercommodity rate relationships, discussed 2052
  Market forces, develop in response to 2045
  Two-level, alternate concept rejected 1286

RATEMAKING See RULE OF RATEMAKING
  Assembling cost theory 680
  Carriers should consider cost of transportation and economic-social impact of 435
  Innovative, encouraged by Rail Revitalization Act 1289

REASONABLE DISPATCH
  Definition discussed 1263, 1359
  Household goods carriers 1264
  Lower rates for less than, not permitted 1288

REASONABLENESS
  Bituminous coal rate structure
    East of the Mississippi, within zone of 315
    West of the Mississippi, in need of guidelines as to zone of 317, 372, 533
  Complaints, absence of, a favorable factor in measuring reasonableness, coal rate structure 316
  Cost of service not only criterion of 505
  Dispatch, definition discussed 1263, 1359
  Export-import rates, between north Pacific and overland common point territory, not in violation of §1 442
  Grains and soybean export rates, interior points to Duluth, Toledo, Chicago, not shown unjust and unreasonable 1441, 1450
  Great Lakes ports, export-import general commodity, grain, TOFC/COFC, and FAK rates not shown unjust and unreasonable 1401
  Inverse rate structure, wheat, overland common point territory to Pacific, unjust and unreasonable 441, 443
  Iron ore rates
    Reasonableness discussed 821, 842
    Return revenues, 230 percent of variable costs, presumably unreasonable 824, 842
  Lignite coal rate structure, reasonable 322
  Particular rates, rate of return, and other considerations 61
  Rate of return on investment as measure of 60, 1499
  Rates exceeding fully allocated costs not necessarily exceeding maximum level of 439
  Relative
    Concept discussed 821, 1181
    Unreasonableness, concept discussed 1399
  Restrictions prohibiting application of domestic rates on export-import traffic to and from Great Lake ports, not shown unjust and unreasonable 1411
  Scrap iron and steel rates
    Reasonableness discussed 1167, 1178, 1183
    Return revenues, 230 percent of variable costs, presumably unreasonable 1185

REDUCED RATES
  Bituminous coal, East 339
  Coal 107, 161, 204
  Iron ore, recommended 824

REFUND RATES
  Coal 107, 161, 204

REGULATIONS OF COMMISSION
  49 CFR 1056.1(c): 1265
  49 CFR 1201, Account 735 410
  49 CFR 1201, §2-4: 1521
  49 CFR 1201, §5-2: 1520

RELEASED RATES
- Must be restricted in commodities and circumstances 1293

RETIREMENT ACCOUNTING See DEPRECIATION

REVENUE STANDARDS See FAIR RETURN ON INVESTMENT

REVENUES See also FUNDS FLOW ANALYSIS
- Car-mile earnings function of both rate level and mileage, lower for longer movements 1381, 1399, 1424
- Coal transportation
  - Discussed 225, 313, 315, 496
  - General increases, effect 354, 372, 518
  - Railroads must generate sufficient, to support investment in facilities needed for increased coal movement 365, 372
- Iron ore transportation
  - Discussed 1125
  - Financial data, involved railroads 792
  - Freight Commodity Statistics, use of, in determining 801, 842
  - General increases generate sufficient 827, 833
  - Per car-mile, decreased, variable cost increased 1126
  - Repetitive movements 643, 691, 701, 728, 774
- Rail revenue contribution (burden study) 10, 26, 1116, 1127
- Scrap transportation
  - Discussed 1015, 1102, 1116
  - Exceed variable costs 1102
  - Financial data, involved railroads 1128
  - Per car-mile, decreased, variable cost increased 1126

RIVER RATES
- Coal 107

ROUTING
- Circuitous, study of, recommended 1307
- Iron ore traffic 658
- Scrap iron traffic 978

RULE OF RATEMAKING
- History of 1543, 1546, 1550, 1555, 1565
- Railroad Revitalization Act
  - Forecasting revenue and expense levels 1566
  - Funds flow analysis, use of 1596, 1606

RULEMAKING PROCEEDINGS
- Terminal operation schedules, suggested 1310

S

SALVAGE See DEPRECIATION, ACCRUED

SCALE RATES See COMMODITY RATES

SCHEDULES
- Definitions, multiple-car, trainload, unit-train service 117, 512
- Service schedules could only be published in 1261

SCRAP IRON AND STEEL See also INVESTIGATIONS; SPECIFIC HEADINGS
- Frequent interchange and costly circuity characterize movement 970
- Holddowns in general increases, environmental consideration 1166
- Iron ore rate, revenue, cost comparisons 1157, 1167, 1199
- Railroad freight rate structure 867, 869, 1185, 1199
- Rate structure by territories 991
- Rates, effect on consumption of 985, 1199
- Revenue contribution 1102, 1116, 1177, 1189
- Service adequate if not optimum 1192
- Transportation characteristics 894, 967, 1189, 1199

SERVICE SCHEDULES See RAILROADS

SHIPPERS
  Billing and forwarding, abuses by 1309
  Railroad conferences with 1295

SHIPSIDE RATES See PRESCRIPTION OF RATES

SHORT TRAINS See RAILROADS

SHOW CAUSE ORDER See ORDER

SINGLE—CAR RATES See PER CAR RATES

SLURRY See PIPELINES

SPECIAL PROJECTS COUNSEL See INVESTIGATIONS

STEEL See SCRAP IRON AND STEEL

STOCK See also DIVIDENDS
  Common
    Market prices, comparative 1666
    Ratings, comparative 1663
  Preferred, cost of 1650, 1662

SUSPENSION See INVESTIGATION AND SUSPENSION

SWITCHING
  Iron ore cars 646, 650, 657, 735, 739, 767, 769
  Scrap iron and steel cars 969, 975, 1196

T

TANK CARS See CARS

TARIFFS See SCHEDULES

TAXES
  Account 532, railway tax accruals 1572, 1605
  Depreciation accounting, track, and 1536
  Income, flow-through v. deferred method 1510, 1571, 1605

TERMINAL OPERATIONS See RAILROADS

TIDEWATER RATES
  Coal 107, 199

TRACK
  Betterment (retirement-replacement) accounting 1502, 1535
  Maintenance and rehabilitation 1278

TRAILER-ON-FLATCAR RATES
  Export-import, Great Lakes ports, found just and reasonable, not unduly preferential and prejudice 1401, 1438

TRAINLOAD RATES
  Coal 107, 211, 313, 322
  Concentration rates 109
  Iron ore, earnings and costs 692, 701, 728
  Level of charges, considerations 115
  Multiple-car rates and 106, 512
  Unit-train rates and 114, 512

TRAINS, SHORT See RAILROADS

TRANSCONTINENTAL TRAFFIC
  Export-import, Pacific coast, discussed 433

TRANSPORTATION ACT OF 1920 See INTERSTATE COMMERCE ACT

TRANSPORTATION CHARACTERISTICS
  Coal 92
  Iron ore 679, 976
  Scrap and iron ore contrasted 975
  Scrap iron and steel 894, 967, 1199

TRANSPORTATION CONDITIONS
  Coal, eastern v. western States 532

U

UNIT-TRAIN RATES
  Coal 107, 211, 313, 322
  Concentration rates 109
  Desirability of, discussed 1246

UNIT-TRAIN RATES—Continued
  History 111
  Iron ore
    Earnings and costs 692, 701, 728, 1177
    Revisions suggested 823
    Service discussed 644, 657, 741
  Level of charges, considerations 115
  Trainload rates and 114, 512

V

VALUATION See also FAIR RETURN ON INVESTMENT
  Account 80, net debits unsupported historically recorded items, inconsistent with values established by 1538
  Aggregate costs in records now principally consist of known actual costs of new property and improvements 1539, 1658
  Commission required only to keep informed of changes in costs and values to permit revisions of basic 1500, 1517
  Commission's policies, history of 1515
  Cost of original 1517
  Cost of reproduction computed in, and original cost of construction, approximately the same 1539
  New, "used and useful" rate base, prohibitively expensive 1520, 1619
  Rate base denominator in general increases 1518

VOLUME RATES See ANNUAL VOLUME RATES; MULTIPLE-CAR RATES; TRAINLOAD RATES; UNIT-TRAIN RATES

W

WATER CARRIERS
  Coal transportation 94, 317
  Federal right-of-way maintenance 1281
  Iron ore transportation 641, 643, 659

WAYBILL SAMPLE
  Coal 306, 322, 328
  Research value, preparation, discussed 366, 372, 534, 2054
  Scrap iron and steel and iron ore, 1969 and 1972, reliability 1071, 1089

WEIGHTS AND WEIGHING
  Scrap iron and steel, each car separately 970

WORDS AND PHRASES
  Accelerated depreciation 1522
  Account 18 1525
  Account 19 1525
  Account 20 1525
  Account 76 1503, 1519
  Account 80 1503, 1537
  Account 90 1503, 1519
  Account 735 1523
  Accrued depreciation 1502
  Actuarial method (depreciation) 44, 1524
  Annual volume rate 107
  Anthracite 79
  Assembling cost theory of ratemaking 680
  ASTRO report 1503, 1557
  Base group 118
  Beneficiated iron ores 555, 565
  Bentonite clay 1437
  Betterment accounting 1502, 1535
  Bituminous 79
  Briquettes (iron ore) 555, 566
  Buffer fund allowance 1542
  Bunching of cars 1229
  Captive traffic 820
  Carloading 473
  Carrying costs 1503
  Cash flow 1512
  Charge coverage 1561
  Coal-slurry pipelines 97
  Comparative risk test 1620
  Concentration rate 107
  Conditional rate 107
  Conference carrier 462
  Conformance index 422
  Constant costs 28, 1026
  Deficit contribution 1116
  Depreciation reserve 1502
  Differential 118
  Differential territory 685
  Disparity 521
  Dispatch, reasonable 1263
  Distortion 521
  Dockage 473

Dollars surviving by vintage 422
Dumping bridge 113
Elasticity 2039
Esch Car Service Act of 1917 1236
Export rate 107
F statistic 2039
Fair value rate base rule 1515
Financial Report Output Generator (FROG) 1513, 1586, 1641
Finish cars 651
Flow-through method 1510
Fourth Section Applications 1307
Free-running cars 1274
Freight Commodity Statistics 801
Freight service, adequate 1248
Fully allocated costs 28, 226, 699, 1026
Funds flow 1512
Funds flow analysis 1573
Gathering rate 107
Gross flows 1514
Handling 473
Home scrap 375
Hook and haul rates 674
Hot metal 901
Index of variation 422
Inner Crescent 119
Iron agglomerates 555, 567
Iron concentrates 555, 566
Iron direct-shipping ores 555
Iron ores 555
Key port formula 1438
Lake-cargo rate 107
Life characteristic indicator 422
Lignite 79
Liquid blast furnace metal 901
Liquity 1560
Metallurgical coal 79
Multiple-car rate 106
Net flows 1514
Net investment 1499
Net railway operating income 1502
Obsolete scrap 876
Official territory 1402
Ohio group 119
Oliphant territory 1416
Ordinary least squares 2039
Outer Crescent 119
Pellets (iron ore) 555, 566, 568, 644
Port of Harbor charges 474
Port terminal charges 474

Preference ore 650
Prompt industrial scrap 876
R^2 or coefficient of determination or multiple determination 2039
Rail Box 1274
Rail-lake 165
Rail-lake-rail 165
Rail-water agreement 476
Rate base 1518
Rate of return formula 1499
Reasonable dispatch 1263
Recapture provisions 1516
Reciprocal demurrage 1290
Refund rate 107
Regression analysis 2039
Relative reasonableness 821
Retirement accounting 415
Retirement experience index 422
Retirement rate method 422
Retirement-replacement accounting 1502
Revenue contribution 28, 1116
River rate 107
SPC commodities groups 2044, 2056
Shipper-be-damned attitude 1233
Shipsides rates 1370
Simulated plant record (SPR) method 414, 1524, 1742
Single-car rate 106
Sinter (iron ore) 555, 567
Slurry 532
Smyth v. Ames 1515
Special Project Staff 2049
St. Louis Terminal Consolidation Project 1268
Standard error 2040
Steam coal 79
Stevedoring 473
Straight line average life procedure 414
Straight-line depreciation 1522
Stub survivor curve 422
Sub-bituminous 79
t-value 2040
Tank-Car case 1237
Tidewater rate 107
Time trend element 2040
Time-volume rates 514
Trailer Train 1274
Train II 1268, 1274
Trainload rate 106

WORDS AND PHRASES—Continued
  Trim cars 651
  Uneven effects 2048
  Unit-train rate 106
  Unit-train service 516
  Variable costs 28, 226, 699, 1026
  Waterborne charges 477
  Wharfage 473
  Working capital 1932

WORKING CAPITAL See also CAPITAL
  Adequacy of, railroads 1557, 1559
  Computation of 1541, 1605
  Manipulation of 1542
  Projection of 1932

U.S. GOVERNMENT PRINTING OFFICE : 1980 O - 329-240 : QL 3

best copy available